

# PUBLIC HEALTH REPORTS.

VOL. XXVII.

APRIL 26, 1912.

No. 17.

## SEWAGE-POLLUTED WATER SUPPLIES IN RELATION TO INFANT MORTALITY.

By Allan J. McLaughlin, Passed Assistant Surgeon, Public Health and Marine-Hospital Service.

The object of this bulletin is to invite attention to the excessive prevalence of "diarrhea and enteritis" of children in certain cities and towns, coincident with a polluted water supply. It will be apparent also that there is generally a parallelism between the curves for typhoid fever and enteritis in the winter months suggesting that water is a factor in the prevalence of both. Attention is invited to these conditions in the hope that cooperation between practicing physicians and local health officers will effect two things:

1. Investigation of deaths in the group classified as diarrhea and enteritis.
2. A wider use of municipal laboratories especially in the diagnosis of typhoid fever and dysentery.

These results can be attained only by the hearty cooperation of practicing physicians with the health officer. It is hoped that this cooperation will be effected, and out of this closer relation will come an earlier recognition and notification of typhoid fever and bacillary dysentery cases, and consequently more prompt and efficient control of the excreta of such patients.

An investigation of this group of diseases will probably reveal facts of the greatest value in relation to bacillary dysentery and other intestinal infections. No more promising field presents itself in the great problem of infant mortality than the study of the intestinal discharges of sick children. After giving due weight to the influence of climatic, racial, social, and economic conditions the so-called non-specific factors, one must admit that these after all are only predisposing factors and that the greater number of deaths from enteritis under 2 years are probably caused by specific organisms, some well known and others of which we know little. It has been suggested that the vital resistance to disease is low in neglected young infants and that this vital resistance is lowered by syphilis and improper artificial feeding. The inference is that normal inhabitants of the human intestine, such as the bacillus coli, may attain sufficient virulence in such cases to cause severe diarrheas and sometimes death. There is little convincing proof of such an occurrence. Failure to find well-known organisms, such as the bacillus dysenteriae, in summer diarrheas of children, must be ascribed in a portion of the failures to faulty

technique, but in the great majority of cases the diagnosis is made as diarrhea or enteritis without any bacteriologic procedure.

These neglected, improperly fed babies may prove easier victims than their healthier brothers and sisters to typhoid fever or dysentery, but such an explanation is not necessary to account for the absence of classical symptoms of well-known diseases in children.

Typical symptoms of well-known diseases are recognized with difficulty in children and are frequently absent. Nervous manifestations are often predominant. Cases of Asiatic cholera in young children in the Philippines often present none of the classic symptoms, but instead are frequently diagnosed as convulsions, meningitis, or enteritis.

The mistaken diagnoses and in consequence the uncontrolled excreta of contagious intestinal disease are not justly attributable to an atypical clinical picture, but must be charged to the failure to establish the diagnosis by bacteriologic methods.

It is not unlikely that because of the atypical clinical picture in children, well-known diseases often do escape recognition and are responsible for many deaths now recorded as due to inanition, convulsions, marasmus, or some other indefinite diagnosis. Because of the common presence of diarrhea in sick infants a great many cases are diagnosed as diarrhea or enteritis without effort to determine the specific cause.

It is not intended to suggest that these infectious agents are purely water-borne germs. On the contrary, as we know in typhoid fever, Asiatic cholera, and bacillary dysentery, the causative agent may be transmitted in many other ways, and it is reasonable to suppose that other pathogenic organisms from the human intestines have a similar versatility in modes of transmission. Attention is invited to the rôle played by water merely as one phase of the problem. A thorough investigation in any city will bring out clearly the relative importance of dirty fingers, flies, and other factors in transmission.

Contact is probably one of the greatest factors in the transmission of diarrhea and enteritis. It is also the factor responsible for the persistence of the disease from year to year. In the winter the contact factor is reduced, but operates at a low rate which increases in the hot months. Flies and other factors augment the increased rate due to contact in the hot season. It is because of the contact factor that the breast-fed infant does not escape. The greater prevalence in bottle-fed babies is probably due to greater opportunities for infection. Young infants drink little water, and the effect of polluted water on infant mortality is probably most active through being mixed with milk. To polluted water also must be charged the infections in children resulting from contact with those who have contracted the disease through water.

#### THE RELATION OF SEWAGE-POLLUTED WATER SUPPLIES TO THE GENERAL DEATH RATE.

In the *Journal of Infectious Diseases*, August 24, 1910, Sedgwick and MacNutt describe what they call the Mills-Reinke phenomenon.<sup>1</sup> This is a marked decrease in the general death rate of cities independent of the reduction in typhoid-fever deaths following the substitu-

<sup>1</sup> Sedgwick and MacNutt: *Journ. Infect. Dis.*, vol. 7, Aug. 24, 1910, pp. 489-564.

tion of a safe for a polluted public water supply. In the same article these writers accentuate the statement of Allen Hazen concerning the relation of a polluted water supply to the general death rate, which is known as Hazen's theorem. Hazen's statement was as follows:

Where one death from typhoid fever has been avoided by the use of better water, a certain number of deaths, probably two or three, from other cases have been avoided.

Sedgwick and MacNutt found abundant evidence of the occurrence of the Mills-Reinke phenomenon in studying the statistics of Hamburg, Lawrence, Lowell, Albany, and Binghamton. They also found that Hazen's "quantitative expression for the Mills-Reinke phenomenon" when applied to the cities which they studied, was sound and conservative. In their work Sedgwick and MacNutt brought out the close relation between polluted water and infant mortality. This fact had also been demonstrated by Reincke of Hamburg who laid especial stress on the diarrheal diseases of children. The general death rate is based upon the total number of deaths into the production of which a great many factors enter. Some of these factors are fairly constant; others are subject to great variation. Obviously it is more difficult to establish the relation between polluted water and the sum of factors, many of which have nothing to do with water, than to show the relation between water and diseases which are commonly water-borne. This difficulty seemed to be reduced by substituting infant mortality for the general mortality. This also is a vague, indefinite method, as infant mortality is made up of a great many different entities, and is subject to considerable fluctuation, due to the epidemic diseases of childhood, the connection of which with water is problematical or doubtful to say the least.

For these reasons the Mills-Reinke phenomenon could not be expected to be always present. Coincident with the substitution of a safe for a polluted water supply, an epidemic of whooping cough, measles, or scarlet fever might more than offset the reduction due to water. Or there might be an increase in pneumonia or diphtheria, which would prevent the general death rate from dropping.

The following charts (1, 2, 3, 4) show four cities which, after the installation of better water supplies, experienced marked reduction in the typhoid-fever rate.

TABLE NO. 1.—CITY OF PITTSBURGH, PA.

*Deaths from certain diseases before and after filtration of the public water supply.*

| Causes of death.            | Before filtration. |        |       | After filtration. |       |       |
|-----------------------------|--------------------|--------|-------|-------------------|-------|-------|
|                             | 1905               | 1906   | 1907  | 1908              | 1909  | 1910  |
| All causes.....             | 9,951              | 10,097 | 9,930 | 9,630             | 8,343 | 9,603 |
| Under 1 year.....           | 2,432              | 2,554  | 2,405 | 2,195             | 1,930 | 2,259 |
| Typhoid fever.....          | 574                | 728    | 645   | 255               | 130   | 149   |
| Measles.....                | 215                | 122    | 68    | 247               | 44    | 177   |
| Scarlet fever.....          | 191                | 81     | 46    | 84                | 70    | 119   |
| Whooping cough.....         | 165                | 86     | 205   | 48                | 68    | 77    |
| Diphtheria.....             | 128                | 178    | 130   | 98                | 82    | 136   |
| Tuberculosis.....           | 897                | 876    | 765   | 762               | 729   | 625   |
| Broncho-pneumonia.....      | 232                | 367    | 508   | 566               | ..... | ..... |
| Lobar pneumonia.....        | 1,081              | 873    | 830   | 686               | 745   | ..... |
| Diarrhea and enteritis..... | 831                | 973    | 915   | 822               | 735   | 949   |

## Summary.

| Causes of death.             | Average annual number of deaths, 3 years, 1905, 1906, 1907. | Average annual number of deaths, 3 years, 1908, 1909, 1910. | Average yearly decrease in deaths. |
|------------------------------|---|---|------------------------------------|
| All causes.....              | 9,993   | 8,992   | 1,001                              |
| Under 1 year.....            | 2,695   | 2,128   | 467                                |
| Typhoid fever.....           | 649   | 178   | 471                                |
| Diarrhea, under 2 years..... | 906   | 835   | 71                                 |
| Tuberculosis.....            | 846   | 705   | 141                                |

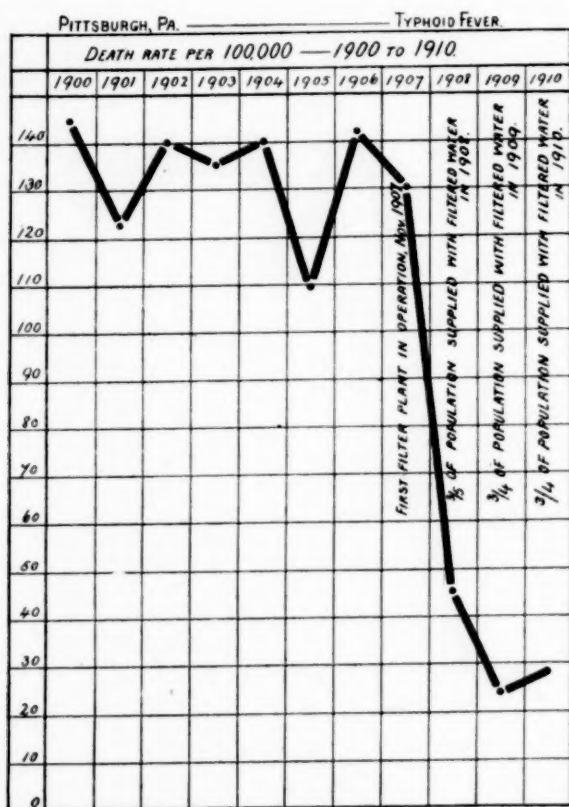


Chart No. 1.

Pittsburgh's reduction in typhoid fever was prompt and consistent. There has been an average of 1,000 actual deaths less each year since the installation of the filters. The average typhoid-fever reduction has been 471 deaths per year, so that for each death from typhoid fever avoided there have been 1.1 deaths less from all other causes. This is considerably less than Hazen's theorem suggests. There were 141 deaths less from tuberculosis, but the decline in tuberculosis has been gradual for some years.



TABLE NO. 2.—CITY OF PHILADELPHIA, PA.

*Deaths from certain diseases before and after filtration of the public water supply.*

| Causes of death.                           | Before filtration. |        |        | After filtration. |        |        |
|--|--------------------|--------|--------|-------------------|--------|--------|
|  | 1905               | 1906   | 1907   | 1908              | 1909   | 1910   |
| All causes.....                            | 25,058             | 27,768 | 27,476 | 25,926            | 25,029 | 27,045 |
| Under 1 year.....                          | 5,263              | 6,010  | 5,522  | 5,386             | 4,992  | 5,334  |
| Typhoid fever.....                         | 724                | 1,078  | 890    | 529               | 341    | 272    |
| Measles.....                               | 94                 | 404    | 99     | 266               | 231    | 164    |
| Scarlet fever.....                         | 67                 | 74     | 120    | 208               | 147    | 152    |
| Whooping cough.....                        | 168                | 396    | 214    | 225               | 122    | 318    |
| Diphtheria.....                            | 466                | 566    | 494    | 489               | 511    | 479    |
| Tuberculosis.....                          | 3,365              | 3,742  | 3,717  | 3,490             | 3,496  | 3,191  |
| Broncho-pneumonia.....                     | 525                | 826    | 709    | 848               | .....  | .....  |
| Lobar pneumonia.....                       | 1,388              | 1,519  | 1,667  | 1,389             | 1,356  | .....  |
| Diarrhea and enteritis, under 2 years..... | 1,739              | 2,184  | 1,886  | 1,835             | 1,791  | 2,336  |

*Summary.*

| Causes of death.                           | Average annual number of deaths, 1905, 1906, 1907. | Average annual number of deaths, 1908, 1909, 1910. | Average yearly decrease in deaths. |
|--|--|--|------------------------------------|
| All causes.....                            | 26,767   | 26,000   | 767                                |
| Typhoid fever.....                         | 897  | 381  | 516                                |
| Diarrhea and enteritis, under 2 years..... | 1,936  | 1,987  | .....                              |

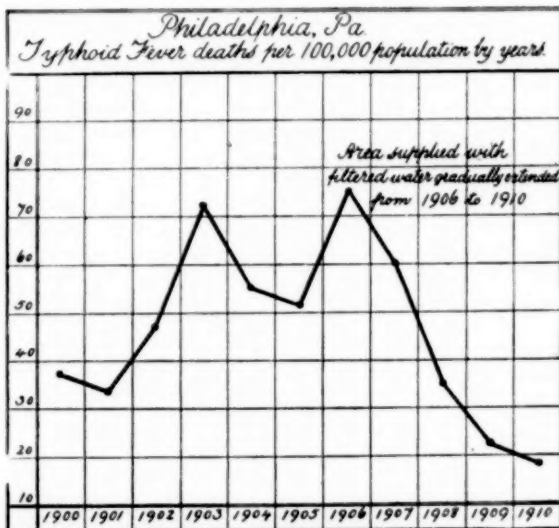


Chart No. 2.

Philadelphia does not conform to the quantitative expression of the Mills-Reincke phenomenon, taking an average of three years before and after the installation of the filters. Tuberculosis shows the same steady progressive fall both before and after filtration which was noted in Pittsburgh.

These two cities, Pittsburgh and Philadelphia, while they effected remarkable reductions in their typhoid fever rates, have the disad-

vantage of furnishing unfiltered polluted water to a portion of the population. Cincinnati and Columbus are better examples of the effect of improved water supplies, as their filtered-water systems cover the entire area of the city.

TABLE NO. 3.—CITY OF CINCINNATI, OHIO.

*Deaths from certain diseases before and after filtration of the public water supply.*

| Causes of death.            | Before filtration. |       |       | After filtration. |       |       |
|-----------------------------|--------------------|-------|-------|-------------------|-------|-------|
|                             | 1905               | 1906  | 1907  | 1908              | 1909  | 1910  |
| All causes.....             | 6,609              | 7,179 | 6,423 | 6,450             | 5,938 | 6,319 |
| Under 1 year.....           | 948                | 1,147 | 901   | 943               | 844   | 917   |
| Typhoid fever.....          | 141                | 247   | 161   | 65                | 48    | 32    |
| Measles.....                | 10                 | 116   | 33    | 34                | 1     | 29    |
| Scarlet fever.....          | 75                 | 14    | 6     | 31                | 17    | 16    |
| Whooping cough.....         | 57                 | 19    | 13    | 29                | 22    | 30    |
| Diphtheria.....             | 79                 | 79    | 53    | 57                | 41    | 36    |
| Tuberculosis.....           | 997                | 1,061 | 926   | 995               | 979   | 1,003 |
| Broncho-pneumonia.....      | 140                | 194   | 169   | 162               | ..... | ..... |
| Lobar pneumonia.....        | 441                | 389   | 373   | 404               | 362   | ..... |
| Diarrhea and enteritis..... | 245                | 366   | 265   | 301               | 282   | 328   |

*Cincinnati, Ohio Typhoid Deaths per 100,000 population.*

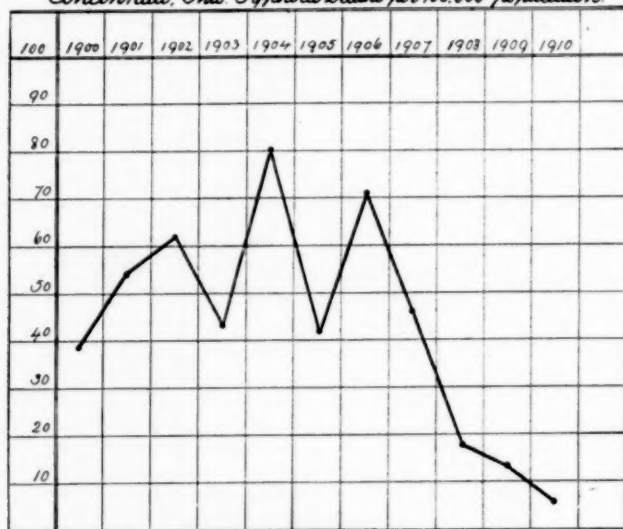


Chart No. 3.

## Summary.

| Causes of death.   | Average annual number of deaths, 1905, 1906, 1907. | Average annual number of deaths, 1908, 1909, 1910. | Average yearly decrease in deaths. |
|--------------------|--|--|------------------------------------|
| All causes.....    | 6,737  | 6,235  | 502                                |
| Typhoid fever..... | 183  | 48   | 135                                |

TABLE NO. 4.—CITY OF COLUMBUS, OHIO.

*Deaths from certain diseases, before and after filtration of the water supply.*

| Causes of death.            | Before filtration. |       |       | After filtration. |       |       |
|-----------------------------|--------------------|-------|-------|-------------------|-------|-------|
|                             | 1905               | 1906  | 1907  | 1908              | 1909  | 1910  |
| All causes.....             | 2,224              | 2,361 | 2,470 | 2,489             | 2,365 | 2,810 |
| Under 1 year.....           | 277                | 364   | 329   | 336               | 316   | 397   |
| Typhoid fever.....          | 121                | 54    | 57    | 168               | 33    | 33    |
| Measles.....                | .....              | 7     | 1     | 5                 | 16    | 43    |
| Scarlet fever.....          | 3                  | 8     | 2     | 1                 | 2     | 6     |
| Whooping cough.....         | 14                 | 7     | 12    | 15                | 5     | 19    |
| Diphtheria.....             | 35                 | 20    | 15    | 14                | 9     | 21    |
| Tuberculosis.....           | 328                | 352   | 346   | 331               | 318   | 337   |
| Broncho-pneumonia.....      | 31                 | 35    | 52    | 30                | ..... | ..... |
| Lobar pneumonia.....        | 184                | 179   | 160   | 144               | 113   | ..... |
| Diarrhea and enteritis..... | 67                 | 71    | 78    | 51                | 83    | 115   |

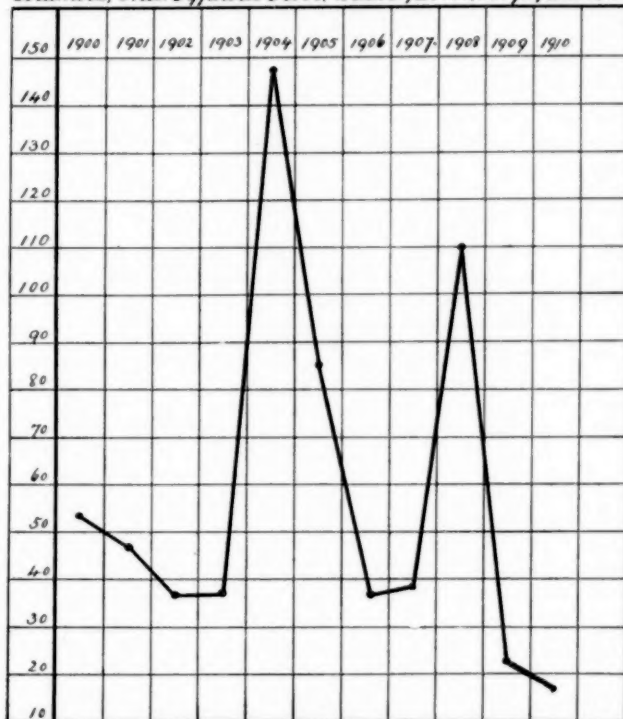
*Columbus, Ohio. Typhoid Fever. Deaths per 100,000 population*

Chart No. 4.

*Summary.*

| Causes of death.   | Average annual number of deaths, two years, 1907, 1908. | Average annual number of deaths, 1909, 1910. | Average yearly decrease in deaths. |
|--------------------|---|--|------------------------------------|
| All causes.....    | 2,479   | 2,587  | Increase.                          |
| Typhoid fever..... | 225   | 66   | 159                                |

Cincinnati seems to conform to Hazen's theorem, but Columbus does not, showing an increase in total deaths coincident with a marked typhoid decrease.

Many things may be cited which have a direct reducing influence on the general death rate—the use of diphtheria antitoxin, the campaign against tuberculosis, greater general knowledge of hygiene and the prevention of disease, the campaign for pure milk, and the educational work for the reduction of infant mortality. For these reasons if a gradual decline in the general death rate is noted coincident with or following an improvement in the public water supply, it can not be ascribed with any certainty to the improvement in the water.

If, however, there is a synchronous marked reduction below the average for a number of years, in certain diseases which are known to be water-borne, and especially if this reduction is effected in the winter and spring months, it is fair to assume that the improved water supply was the principal factor in this reduction.

Two distinct reasons are assigned for the reduction in the general mortality independently of typhoid fever which so often follows the installation of better water supplies. First, the increased vital resistance due to drinking a better water; second, exclusion of disease-producing organisms. It has been suggested that possibly a combination of these two is responsible. There is considerable evidence to show that the exclusion of disease-producing germs from the water is the principal factor in reducing the general mortality in so far as water is concerned.

In addition to the exclusion of the *bacillus typhosus* and the *vibrio cholerae Asiaticæ*, pure water means the exclusion of the causative organisms of bacillary dysentery, and probably other causative agents in diarrheal diseases of which we know little. The evidence that the so-called winter cholera is due to sewage-polluted water supplies may be considered incontrovertible. The exact nature of this alleged disease is unknown, but its existence and relation to polluted water have been shown conclusively at Erie, Pa., Escanaba, Lansing, and Mackinac Island, Mich., Michigan City, Ind., and other places.

There is no doubt that part of the reduction in the general death rate is due to a reduction in the deaths frequently certified to as "malaria," "typho-malarial fever," "typhoid pneumonia," and even "pneumonia" itself because of mistaken diagnosis. In many places there is very good reason to believe that there is a big reduction effected in fatal diarrhea of children really due to the *bacillus typhosus*. There is in some sections of the country a fixed idea that typhoid fever is a disease of adults and is rarely found in children. There is another common fallacy, that typhoid fever is a disease of summer and autumn only. It is due to these ideas that physicians are sometimes loath to diagnose typhoid fever in a child or to declare its existence in adults in the winter or spring. A health commissioner of one of the lake cities exhibited to the writer his record of cases reported in August, September, and October, pointing out the fact that there were nearly 10 cases reported for each death from typhoid fever. This was very creditable, but his records for January, February, March, and April showed that the cases reported scarcely exceeded the deaths. Very often the water supply is known to be polluted and the number of deaths from typhoid in the winter months shows that there is an undue prevalence of the disease in winter. The cases reported in relation to deaths would indicate perhaps a case

mortality of 80 or 90 per cent. It is clear that in such instances the bulk of the nonfatal cases are not diagnosed as typhoid fever, and it is very probable that many fatal cases are certified as something else. In such cities it is not strange that the substitution of a safe for a polluted water supply effects a reduction not only in typhoid fever but in the general mortality as well.

#### DIARRHEA AND ENTERITIS UNDER 2 YEARS OF AGE IN THE UNITED STATES.

In the registration cities of the United States about 20 per cent of the total mortality occurs in infants under 1 year of age. The importance of infant mortality in relation to general death rate is at once apparent.

In considering infant mortality one of the greatest factors is the group of entities classified as diarrhea and enteritis. In the registration area in 1910 there were 154,373 deaths of children under 1 year, and 44,695 of these, or about 28 per cent, were ascribed to diarrhea and enteritis.

In the mortality statistics of the Bureau of the Census, under the name of diarrhea and enteritis, are grouped a number of different entities of diverse etiology. About 85 per cent of these deaths occur in children under two years of age. The fact that several distinct entities are included complicates the study of this group, and usually no attempt is made to separate these entities upon a specific etiologic basis. It is generally conceded, however, that certain nonspecific factors bear an etiologic relation to diarrhea and enteritis. At least the presence of one or more of these factors in marked degree is deemed sufficient to explain a high rate for diarrhea and enteritis in cities. These nonspecific etiologic factors may be divided into climatic, racial, social, and economic.

#### CLIMATIC INFLUENCES.

The influence of climate upon enteritis is conceded, but the manner in which this influence is exerted is still in doubt. The enteritis of children, including cholera infantum, is a summer disease, and if we exclude water or milk borne epidemics of specific enteritis, it should have a very low prevalence in the months from November to April. Naturally the southern cities, with their longer summer, on this ground alone are entitled to a higher rate for the hot-weather enteritis of children. Table No. 5 shows American cities with populations ranging from 100,000 to 300,000:

TABLE NO. 5.—*Cities having a population of from 100,000 to 300,000—Death rate per 100,000 from enteritis, all ages—Average for 8 years, 1901 to 1908.*

| City.                   | Rate. | City.                  | Rate. |
|-------------------------|-------|------------------------|-------|
| St. Joseph, Mo.....     | 37.5  | Syracuse, N. Y.....    | 111.3 |
| Omaha, Nebr.....        | 54.8  | New Haven, Conn.....   | 116.6 |
| St. Paul, Minn.....     | 57.5  | Worcester, Mass.....   | 127.2 |
| Minneapolis, Minn.....  | 58.5  | Paterson, N. J.....    | 133.4 |
| Columbus, Ohio.....     | 60.9  | Providence, R. I.....  | 150.8 |
| Louisville, Ky.....     | 63.9  | Bridgeport, Conn.....  | 156.1 |
| Kansas City, Mo.....    | 64.9  | Nashville, Tenn.....   | 156.2 |
| Dayton, Ohio.....       | 70.7  | Atlanta, Ga.....       | 168   |
| Denver, Colo.....       | 80.5  | Jersey City, N. J..... | 169.4 |
| Indianapolis, Ind.....  | 84.7  | Richmond, Va.....      | 176.3 |
| Toledo, Ohio.....       | 86.6  | Scranton, Pa.....      | 178.2 |
| Rochester, N. Y.....    | 91.3  | Lowell, Mass.....      | 274.1 |
| Memphis, Tenn.....      | 101.1 | Fall River, Mass.....  | 376.5 |
| Grand Rapids, Mich..... | 103.1 |                        |       |



It will be noted that the first 10 cities have rates below 90, and that every one of these is north of the thirty-eighth parallel of latitude and west of the eighty-third meridian.

It must not be inferred that the low rates in this area are entirely due to climatic influences. In most of these cities there is an absence of other factors, racial or economic, which play their part in the low rates.

On the other hand, favorable climatic conditions are not sufficient to prevent high rates in those northeastern cities, such as Fall River and Lowell, which possess the racial, social, or economic factors which make for high enteritis rates. In this class of cities (100,000 to 300,000) the eastern and southern cities, as shown above, have higher rates than those of the north and west, though probably for different reasons. The cities in the south have the climatic factor exaggerated greatly by the length of the summer and comparatively mild winters. The New England cities have high rates entirely independent of climate and depending in greatest measure upon certain economic conditions.

#### THE RACIAL FACTOR.

Racial characteristics are potent factors for good or ill in the prevention of infant mortality, although it is difficult to separate racial from economic influences. The pernicious effect of race is not because of the race itself but rather because the economic condition of the race is poor, and poverty and ignorance usually go hand in hand.

The southern cities suffer most from racial influences. The large negro population furnishes a very much higher rate per 100,000 for enteritis than the white population.

TABLE NO. 6.—*Diarrhea and enteritis—Number of deaths per 100,000 population.*

| Cities.                | 1906   |          | 1907   |          | 1908   |          |
|------------------------|--------|----------|--------|----------|--------|----------|
|                        | White. | Colored. | White. | Colored. | White. | Colored. |
| Washington, D. C. .... | 98.4   | 216.1    | 88     | 227.1    | 94     | 202.5    |
| Baltimore.....         | 123.1  | 172.9    | 143.3  | 224.1    | 122    | 153.8    |
| New Orleans.....       | 161.4  | 218.7    | 176.8  | 229.4    | 166.3  | 239.8    |

These higher rates are due in greatest measure to the insanitary conditions under which the people live.

#### SOCIAL AND ECONOMIC CONDITIONS.

This includes the well-known influence of the slums of our large cities on infant mortality. It also includes the high mortality among children of working mothers in mill and factory towns. These conditions are due primarily to poverty and ignorance, and are accentuated in the foreign quarters and among the negro population. The rate to be expected from slum conditions should be in direct proportion to the size of the city. In this complex problem this is not always the case, as some of the small cities have high rates due to other causes than slums. In general, however, all cities in America of over 300,000 population have high rates. St. Louis, Mo., is the only exception.

TABLE NO. 7.—*Enteritis, all ages, death rate per 100,000—Average for eight years, 1901 to 1908—Cities with populations of over 300,000.*

| Cities.           | Rate. | Cities.         | Rate. |
|-------------------|-------|-----------------|-------|
| Pittsburgh.....   | 205.1 | Chicago.....    | 135.4 |
| New Orleans.....  | 177.4 | Newark.....     | 134.7 |
| New York.....     | 162.6 | Milwaukee.....  | 128.5 |
| Buffalo.....      | 155.2 | Detroit.....    | 122.9 |
| Philadelphia..... | 144.7 | Cincinnati..... | 117.9 |
| Baltimore.....    | 140.7 | Boston.....     | 115.4 |
| Cleveland.....    | 136.6 | St. Louis.....  | 88.1  |
| Washington.....   | 135.6 |                 |       |

The high rates in these large cities are not surprising. New York because of its size should head the list, but New York has a very good water supply, and must give place to Pittsburgh, which previous to 1908 had a grossly polluted water supply, and the southern city of New Orleans, where the racial and climatic factors are accentuated. Buffalo's rate is altogether too high considering its population, but Buffalo also has suffered from a polluted water supply.

The appalling infant mortality in certain manufacturing cities and towns, especially those dependent on the steel and allied industries, is probably due to a combination of racial and economic factors. There is a very large percentage of foreigners in these cities, and probably a very high birth rate. The insanitary conditions are said to be very apparent. A special study of infant mortality in this class of industrial city would be necessary to determine accurately the real causes of this frightful infant mortality.

It is unfortunate that in America we are unable to secure accurate infant mortality rates because of lack of registration of births. The rates per 100,000 population are not an accurate index of the real infant mortality. Neither is the percentage of infant to total deaths a reliable guide. The true index of infant mortality is the death rate per 1,000 births.

For this reason the very high rates per 100,000 population in a city with a large foreign population and consequently high birth rate might seem much less significant if we had the ratio of deaths under 1 year to each 1,000 births.

In spite of these disadvantages the death rate per 100,000 for diarrhea and enteritis is an index, if an imperfect one, of the infant mortality, and in most instances in this country must be employed for lack of a better criterion.

If we could eliminate the enteritis due to water we would have in these rates a very fair index of any city's sanitary condition. The city which is too small to have slums and which in spite of a good water supply has a very high enteritis rate has also in all probability insanitary conditions which are not essentially different from the slums of the large cities, at least in their effect upon infant mortality.

The enteritis rate for the smaller cities (less than 100,000) is even more accurate as an index of sanitary conditions, if we exclude water-borne enteritis. Table No. 8 shows the average rate for five years (1904-1908) for enteritis in cities with populations between 50,000 and 100,000. These may be divided conveniently into three classes: The first 15 have rates from 50 to 100; the second 15 have rates from 100 to 150; the third group of 13 have rates ranging from 164.7 in Schenectady, N. Y., to 342.3 in Charleston, S. C.

TABLE NO. 8.—*Enteritis, all ages—Death rate per 100,000 in cities with a population from 50,000 to 100,000.*

| Cities.                | Rate. | Cities.                | Rate. |
|------------------------|-------|------------------------|-------|
| Canton, Ohio.....      | 50.9  | Johnstown, Pa.....     | 122.6 |
| Lincoln, Nebr.....     | 56.9  | South Bend, Ind.....   | 128.7 |
| Saginaw, Mich.....     | 59.6  | Utica, N. Y.....       | 133.7 |
| Covington, Ky.....     | 65.0  | Allentown, Pa.....     | 134.9 |
| Harrisburg, Pa.....    | 65.2  | Mobile, Ala.....       | 135.8 |
| Fort Wayne, Ind.....   | 72.2  | Pawtucket, R. I.....   | 137.1 |
| Somerville, Mass.....  | 75.9  | Hoboken, N. J.....     | 145.7 |
| Portland, Me.....      | 77.4  | Wilkes-Barre, Pa.....  | 147.0 |
| Evansville, Ind.....   | 82.3  | Schenectady, N. Y..... | 164.7 |
| Springfield, Mass..... | 87.6  | Youngstown, Ohio.....  | 186.5 |
| Altoona, Pa.....       | 91.6  | Elizabeth, N. J.....   | 191.7 |
| Lynn, Mass.....        | 94.4  | Manchester, N. H.....  | 195.8 |
| Springfield, Ill.....  | 95.3  | Holyoke, Mass.....     | 199.8 |
| Terre Haute, Ind.....  | 96.2  | Yonkers, N. Y.....     | 207.7 |
| Hartford, Conn.....    | 97.0  | Waterbury, Conn.....   | 217.9 |
| Duluth, Minn.....      | 103.1 | Bayonne, N. J.....     | 224.9 |
| Wilmington, Del.....   | 106.3 | Passaic, N. J.....     | 230.7 |
| Troy, N. Y.....        | 112.4 | Lawrence, Mass.....    | 257.1 |
| Camden, N. J.....      | 113.9 | New Bedford, Mass..... | 257.6 |
| Erie, Pa.....          | 116.6 | San Antonio, Tex.....  | 268.3 |
| Savannah, Ga.....      | 119.0 | Charleston, S. C.....  | 342.3 |
| Reading, Pa.....       | 121.8 |                        |       |

The first group of 15 with rates below 100 contains no city south of the thirty-eighth parallel of latitude. Some eastern cities are in this group. They are not "mill" towns, however, but cities of quite a different type, as Somerville, Mass., Hartford, Conn., and Harrisburg, Pa.

The second group has cities from all sections. The rates 100 to 150 are too high for cities of this size, and an intensive study of conditions will show the special reason or reasons in each case.

Duluth's rate of 103 is higher than one would expect. St. Paul and Minneapolis have rates below 60; Duluth's rate should be no higher. There is no negro factor to raise the rate, but there is quite a large foreign population. South Bend, like Duluth, has very much higher rates than cities in the surrounding territory. Wilmington, Del., Savannah, Ga., and Mobile, Ala., have rates no higher than might be expected with the large negro population. The excessive rates in group 3 are best explained by the insanitary conditions, high birth rate, maternal neglect, ignorance, and poverty of mill and factory towns. The last two cities are southern cities, and probably find the explanation of their high rates in climatic and racial influences.

During an investigation of cities in the drainage basin of the Great Lakes the writer was struck with the high rates for diarrhea and enteritis in some northern cities coincident with polluted water supplies and an absence of slums. A close relation also seemed to exist between the rates for enteritis and typhoid fever. The following table shows 12 New York cities. The first four have good water supplies, good sanitary conditions, and low rates for both typhoid and enteritis. The second four have good water supplies, low typhoid rate, bad sanitary conditions (mill and factory towns), and high enteritis rates. The last group of four have polluted water supplies, fair to good sanitary conditions, high typhoid-fever rates, and high enteritis rates.

TABLE No. 9.—*Cities in New York State.*

| Cities.            | Typhoid-fever death rate per 100,000, average, 10 years, 1900-1909. | Character of water supply. | Death rate, enteritis—average for 5 years, 1904-1908. | Remarks.                                      |
|--------------------|---|----------------------------|---|---|
| Rochester.....     | 13.7  | Good.....                  | 89.5  | Sanitary conditions good.                     |
| Syracuse.....      | 14.8  | .....do.....               | 105.5   |   |
| Albany.....        | 21.9  | .....do.....               | 80.0  |   |
| Binghamton.....    | 20.9  | .....do.....               | 104.7   |   |
| Utica.....         | 17.3  | .....do.....               | 133.7   |   |
| Schenectady.....   | 22.4  | .....do.....               | 164.7   | Mill and factory towns.                       |
| Amsterdam.....     | 18.6  | .....do.....               | 150.7   |   |
| Yonkers.....       | 9.5   | .....do.....               | 207.7   |   |
| Cohoes.....        | 83.8  | Polluted.....              | 170.9   | Mill town.                                    |
| Niagara Falls..... | 129.1   | .....do.....               | 173.2   | Sanitary conditions exclusive of water, good. |
| Ogdensburg.....    | 148.5   | .....do.....               | 175.0   |   |
| Buffalo.....       | 27.0  | .....do.....               | 151.6   |   |

A similar relation between typhoid and enteritis was found in Michigan, although coincidently high rates were not always associated with a polluted water supply.

The Michigan rates are for diarrhea and enteritis under 2 years instead of for all ages.

TABLE No. 10.—*Michigan cities, population from 12,000 to 50,000—Deaths per 100,000, average for 6 years, 1905-1910.*

| Cities.               | Typhoid fever. | Enteritis. | Water supply.               |
|-----------------------|----------------|------------|-----------------------------|
| Escanaba.....         | 136            | 185        | Polluted.                   |
| Sault Ste. Marie..... | 52.3           | 134.6      | Good.                       |
| Alpena.....           | 46.7           | 162.6      | Polluted.                   |
| Ironwood.....         | 43.5           | 124.5      | Doubtful.                   |
| Port Huron.....       | 42             | 78.6       | Polluted.                   |
| Flint.....            | 43             | 63         | Do.                         |
| Traverse City.....    | 42             | 53.5       | Do.                         |
| Bay City.....         | 37.3           | 56.3       | Do.                         |
| Lansing.....          | 33.3           | 56.6       | Good.                       |
| Battle Creek.....     | 31.3           | 44         | Doubtful.                   |
| Kalamazoo.....        | 29.5           | 59         | Good.                       |
| Jackson.....          | 28.3           | 45.5       | Do.                         |
| Muskegon.....         | 24.7           | 59.8       | Doubtful.                   |
| Saginaw.....          | 24.6           | 42         | Wells safe; river polluted. |
| Pontiac.....          | 24.5           | 44         | Good.                       |
| Ann Arbor.....        | 22.1           | 18.6       | Do.                         |
| Manistee.....         | 20.8           | 48         | Do.                         |

This table shows that in every instance, except Traverse City, a typhoid-fever rate above 40 was accompanied by an enteritis rate above 60. This is a high rate for Michigan cities, considering climatic, racial, and social economic conditions, as this rate is for enteritis under 2 years only. On the other hand, the cities with good water supplies had low rates for typhoid fever and enteritis except Sault Ste. Marie, which will be referred to later.

It is probable that contamination of food and drink with human feces is a very great factor in the mortality ascribed to diarrhea and enteritis. When there is gross pollution of a public water supply, as at Niagara Falls or Escanaba, this contamination may be transmitted by water, but from experience with typhoid fever and cholera it may be assumed that this fecal contamination is very often effected independently of the water supply by dirty fingers, flies, and in other ways. The enteritis so transmitted would necessarily have its great-

SALLY SIX MARIE COMPARED WITH MARQUETTE, MICH. - ENTERTAINMENT UNDER 2 YEARS

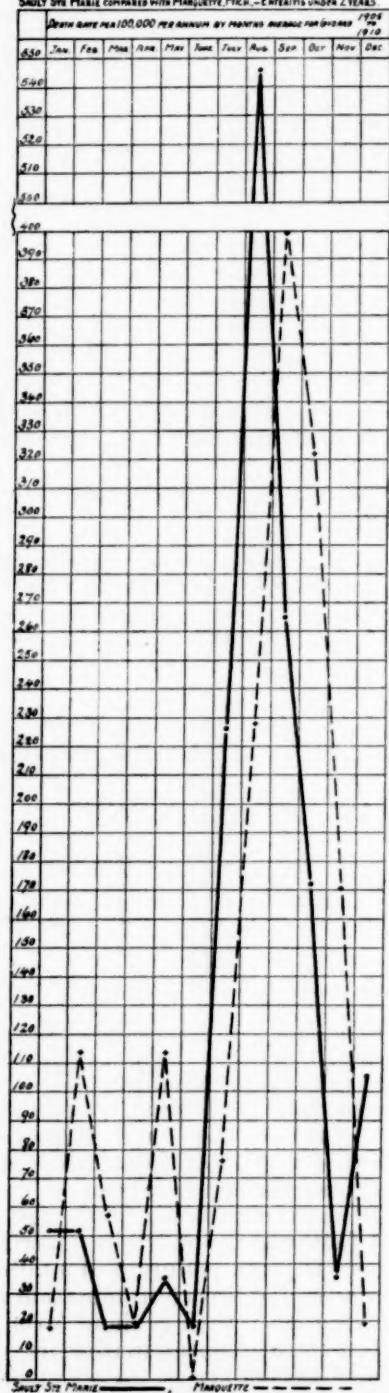


Chart No. 5.



est prevalence in the hot months and its rate would be high in direct proportion to the insanitary surrounding of the victims.

Sault Ste. Marie has a very high rate for enteritis. The public water supply must be classed as good. As a consequence it is not strange that the winter and spring rate in Sault Ste. Marie is much lower than that of Marquette with its polluted water supply. Chart No. 5 shows the difference in the seasonal prevalence.

Ishpeming has a low typhoid-fever rate and a water supply which is probably safe. It has a very high death rate for diarrhea and

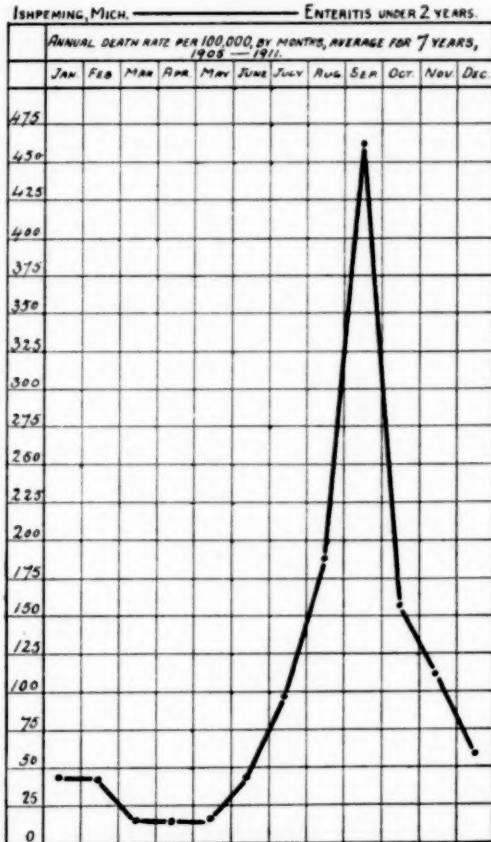


Chart No. 6.

enteritis. This is probably due to the insanitary conditions under which the foreign population lives. The greatest seasonal prevalence is in the summer and autumn months with practically no deaths in the winter and spring months. Chart No. 6 shows the seasonal prevalence in Ishpeming.

The factors operating in the summer months—flies, fingers, careless disposal of excreta, bad personal hygiene—are scarcely separable from the other factors associated with poverty and ignorance, including maternal neglect.

From a study of statistics and conditions in cities and towns in the drainage basin of the Great Lakes, the writer is inclined to believe

that the reduction in the general death rate coincident with and following improvement in the water supply independent of typhoid reduction, is largely due to the reduction effected in the group of entities classified as diarrhea and enteritis.

THE RELATION OF POLLUTED WATER SUPPLIES TO THE SO-CALLED  
DIARRHEA AND ENTERITIS OF CHILDREN.

In attempting to estimate the importance of water in the prevalence of diarrhea and enteritis it will be necessary to consider the deaths by months. This disease, or group of diseases, if not water borne, has a relatively low prevalence in the winter and spring months. This point is well illustrated by the seasonal prevalence in cities with good water supplies. In dealing with seasonal prevalence the climatic factor is very prominent. For this reason it would be manifestly unfair to compare southern with northern cities. In the following consideration of enteritis the writer will confine himself to cities north of the thirty-ninth parallel and east of the Mississippi River.

In cities with good public water supplies the seasonal prevalence of the diarrhea and enteritis of children is uniform, and Chart No. 7 illustrates this seasonal prevalence in the city of New York. If the public water supply is not a factor, the greatest number of deaths should occur in July and August.

TABLE No. 11.—*Cities having a population of over 250,000 and enteritis rates above 100 per 100,000.*

| Cities.                | Enteritis under 2 years—annual death rate per 100,000. |                                 |                                | Ratio of summer to winter enteritis. | Character of water supply.                            |
|------------------------|--|---------------------------------|--------------------------------|--------------------------------------|---|
|                        | Entire year, 1910.                                     | Summer, June to November, 1910. | Winter, December to May, 1910. |                                      |   |
| Jersey City, N. J..... | 146  | 259                             | 37                             | 7 to 1                               | Safe.   |
| Detroit, Mich.....     | 123  | 212                             | 34                             | 6.2 to 1                             | Doubtful; exposed to pollution.                       |
| Boston, Mass.....      | 100  | 172                             | 32                             | 5.3 to 1                             | Good.   |
| Newark, N. J.....      | 113  | 189                             | 42                             | 4.4 to 1                             | Do.   |
| New York, N. Y.....    | 123  | 198                             | 46                             | 4.3 to 1                             | Do.   |
| Buffalo, N. Y.....     | 132  | 209                             | 53                             | 3.9 to 1                             | Polluted at times.                                    |
| Pittsburgh, Pa.....    | 179  | 277                             | 77                             | 3.6 to 1                             | One-fourth of the population uses unfiltered water.   |
| Cleveland, Ohio.....   | 169  | 261                             | 73                             | 3.5 to 1                             | Polluted at times.                                    |
| Philadelphia, Pa. .... | 150  | 241                             | 70                             | 3.4 to 1                             | A portion of the city uses unfiltered polluted water. |
| Chicago, Ill.....      | 159  | 248                             | 102                            | 2.4 to 1                             | Polluted.   |
| Milwaukee, Wis.....    | 117  | 147                             | 89                             | 1.6 to 1                             | Do.   |

A study of the statistics of cities with good water supplies and fairly high enteritis rates brings out an interesting phenomenon. The mean annual enteritis death rate per 100,000 for the months of June, July, August, September, October, and November bears a definite relation to the rate for December, January, February, March, April, and May. This will be referred to as the ratio between the summer and winter enteritis rates. If very low annual rates for enteritis prevail, this relation is disturbed; but if the rates are above the normal, even if very excessive, as in some mill towns, the ratio is preserved, provided the public water supply is not polluted.

In large cities with enteritis rate per 100,000 of more than 100 for the entire year the ratio of summer to winter enteritis should be not less than 4 to 1, provided the public water supply is not grossly polluted.

New York, N. Y. ————— ENTERITIS UNDER 2 YEARS.

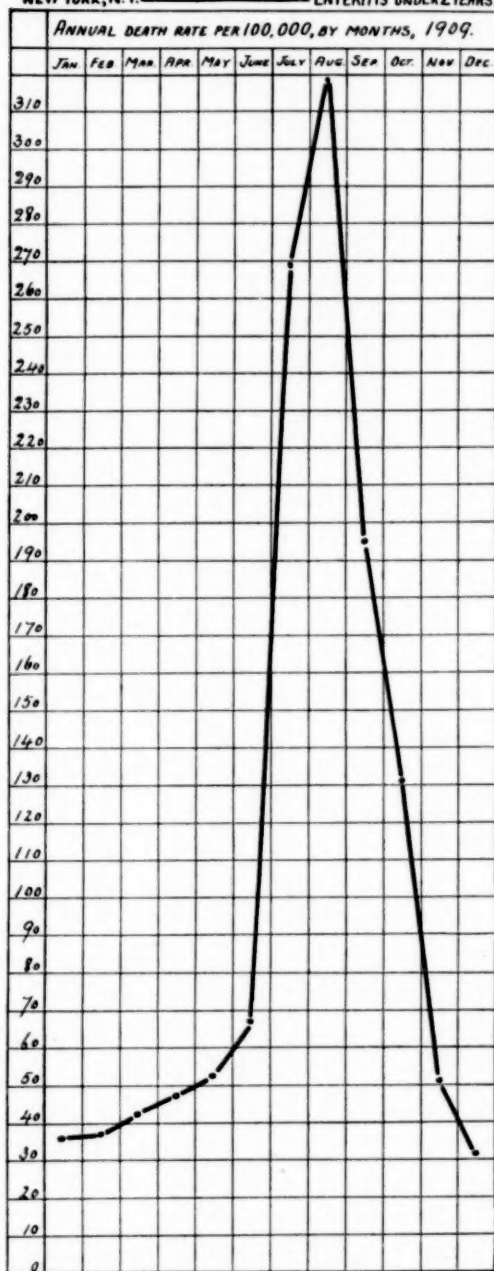


Chart No. 7.

TABLE NO. 12.—*Cities having populations from 100,000 to 250,000 and enteritis rates above 90 per 100,000.*

| Cities.               | Death rate per 100,000; enteritis under 2 years, 1910. | Ratio of summer to winter enteritis. | Cities.                 | Death rate per 100,000; enteritis under 2 years, 1910. | Ratio of summer to winter enteritis. |
|-----------------------|--|--------------------------------------|-------------------------|--|--------------------------------------|
| Paterson, N. J.....   | 117.3  | 8.8 to 1                             | Cambridge, Mass.....    | 94.2   | 6.0 to 1                             |
| Worcester, Mass.....  | 134.3  | 7.9 to 1                             | Rochester, N. Y.....    | 99.7   | 5.4 to 1                             |
| Fall River, Mass..... | 373.8  | 7.3 to 1                             | Grand Rapids, Mich..... | 95.4   | 5.7 to 1                             |
| Scranton, Pa.....     | 230.8  | 7.3 to 1                             | Bridgeport, Conn.....   | 123.7  | 4.7 to 1                             |
| Lowell, Mass.....     | 252.0  | 6.9 to 1                             | Syracuse, N. Y.....     | 122.4  | 3.7 to 1                             |
| Dayton, Ohio.....     | 91.6   | 6.6 to 1                             |                         |  |                                      |

TABLE NO. 13.—*Cities in the State of New York.*

| Cities.            | Enteritis under 2 years, death rate per 100,000, average for 3 years, 1908-1910. |                          | Ratio of summer to winter diarrhea. | Character of water supply. |
|--------------------|--|--------------------------|-------------------------------------|----------------------------|
|                    | Summer, June to November.  | Winter, December to May. |                                     |                            |
| Amsterdam.....     | 342  | 27                       | 12.5 to 1                           | Good.                      |
| Utica.....         | 254  | 29                       | 8.7 to 1                            | Do.                        |
| Troy.....          | 169  | 21                       | 8.0 to 1                            | Do.                        |
| Binghamton.....    | 162  | 21                       | 7.7 to 1                            | Safe.                      |
| Schenectady.....   | 229  | 34                       | 6.7 to 1                            | Good.                      |
| Syracuse.....      | 207  | 31                       | 6.6 to 1                            | Do.                        |
| Rochester.....     | 152  | 26                       | 5.8 to 1                            | Do.                        |
| Albany.....        | 95   | 19                       | 5.0 to 1                            | Do.                        |
| New York.....      | 208  | 44                       | 4.7 to 1                            | Do.                        |
| Yonkers.....       | 337  | 74                       | 4.5 to 1                            | Do.                        |
| Buffalo.....       | 106  | 29                       | 3.6 to 1                            | Polluted.                  |
| Niagara Falls..... | 191  | 93                       | 2.0 to 1                            | Grossly polluted.          |
| Cohoes.....        | 221  | 133                      | 1.6 to 1                            | Do.                        |

It is clear also that no deduction regarding the part played by water can be drawn safely from high rates in winter months alone unless these rates are more than one-fourth of the rates for the summer months. For example, high rates in Yonkers or Amsterdam in December, January, February, March, April, and May do not necessarily indicate polluted water, in view of the fact that the summer rates are very high and more than four times those of the winter months.

High rates in the winter months with relatively low rates in the summer months, as in Cohoes and Niagara Falls, leave no escape from the conviction that the polluted water supply is a big factor in this mortality. In the territory north of the thirty-eighth parallel and east of the Rocky Mountains there is no factor in the transmission of intestinal diseases except water, which operates consistently with greatest intensity from December to May.

The possibility of milk causing outbreaks of intestinal diseases in winter or spring months is admitted, but milk is unlikely to operate with greater intensity in winter consistently for a number of years.

NIAGARA FALLS, N.Y.; BINGHAMTON, N.Y. — ENTERITIS UNDER 2 YEARS.

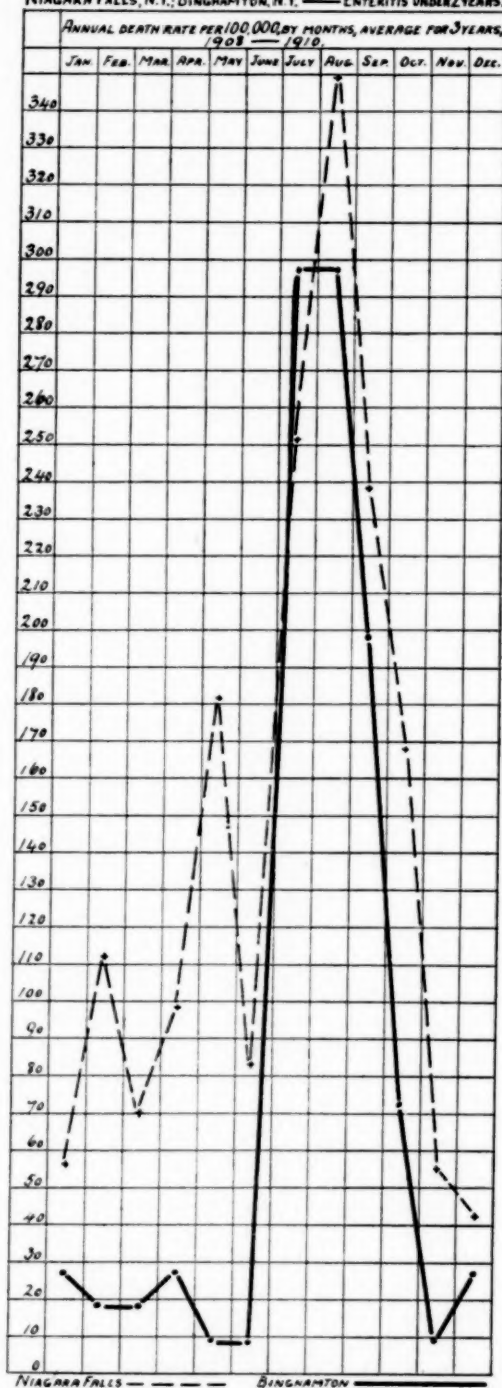


Chart No. 8.



TABLE NO. 14.—*Cities in the State of Michigan.*

| Cities.               | Enteritis under two years, death rate per 100,000, average for six years, 1905 to 1910. |                         | Ratio of summer to winter enteritis. | Character of water supply.  |
|-----------------------|---|-------------------------|--------------------------------------|-----------------------------|
|                       | Summer—June to November.  | Winter—December to May. |                                      |                             |
| Battle Creek.....     | 77  | 9                       | 8.5 to 1                             | Fair.                       |
| Jackson.....          | 89  | 11                      | 8 to 1                               | Pure.                       |
| Flint.....            | 111   | 15                      | 7.4 to 1                             | Wells pure; river polluted. |
| Lansing.....          | 96  | 14                      | 6.8 to 1                             | Good.                       |
| Sault Ste. Marie..... | 278   | 43                      | 6.4 to 1                             | Do.                         |
| Bay City.....         | 101   | 16                      | 6.3 to 1                             | Doubtful.                   |
| Grand Rapids.....     | 140   | 27.2                    | 5.1 to 1                             | Do.                         |
| Port Huron.....       | 135   | 33                      | 4 to 1                               | Polluted.                   |
| Marquette.....        | 199   | 57                      | 3.4 to 1                             | Do.                         |
| Alpena.....           | 257   | 91                      | 2.8 to 1                             | Do.                         |
| Escanaba.....         | 209   | 168                     | 1.2 to 1                             | Grossly polluted.           |

In Michigan it is probable that the summer enteritis rate should be more than four times the winter rate. The three cities which fall below the ratio of 4 to 1 all have polluted water supplies, and this is also true of Grand Rapids and Port Huron, the next on the list.

Chart No. 8 shows the seasonal prevalence in Niagara Falls, compared with Binghamton, N. Y. Niagara Falls has a grossly polluted water supply, while Binghamton has a safe one.

Chart No. 9 shows Cohoes compared with Amsterdam. Cohoes has a grossly polluted water supply, while Amsterdam's supply is rated as good. Amsterdam has a very much higher rate in July, August, and September than Cohoes, and if no water factor entered into the problem should have the higher rate in the winter and spring months. The high rate in Cohoes for December, January, and February is very striking.

Chart No. 10 shows Marquette, Mich., compared with the normal curve for the State of Michigan. The sharp rises in February and May are noticeable. Marquette has had a very high typhoid rate and the water supply has been grossly polluted at times.

Chart No. 11 shows Buffalo, N. Y., compared with Washington, D. C. Buffalo has a polluted water supply. Washington has a safe water supply. Buffalo has a lower rate than Washington in the summer and should have a lower winter rate if water was not a factor. The high rates in March, April, and May in Buffalo are well shown on the chart.

Chart No. 12 compares Chicago and New York. The Chicago rates are abnormally high from January to June and a distinct peak is noticeable in March.

Chart No. 13 shows Milwaukee compared with Jersey City. Milwaukee has a sewage-polluted water supply while Jersey City's supply is safe. The abnormal peak in March and the very high rates in March and April are very striking and suggestive. Jersey City, with its very high rate in July, August, and September, would have a higher rate than Milwaukee during the winter months if the winter rates depended upon other factors than water.

Chart 14 shows Cleveland compared with Jersey City. Cleveland has had a polluted water supply in the winter and spring months.

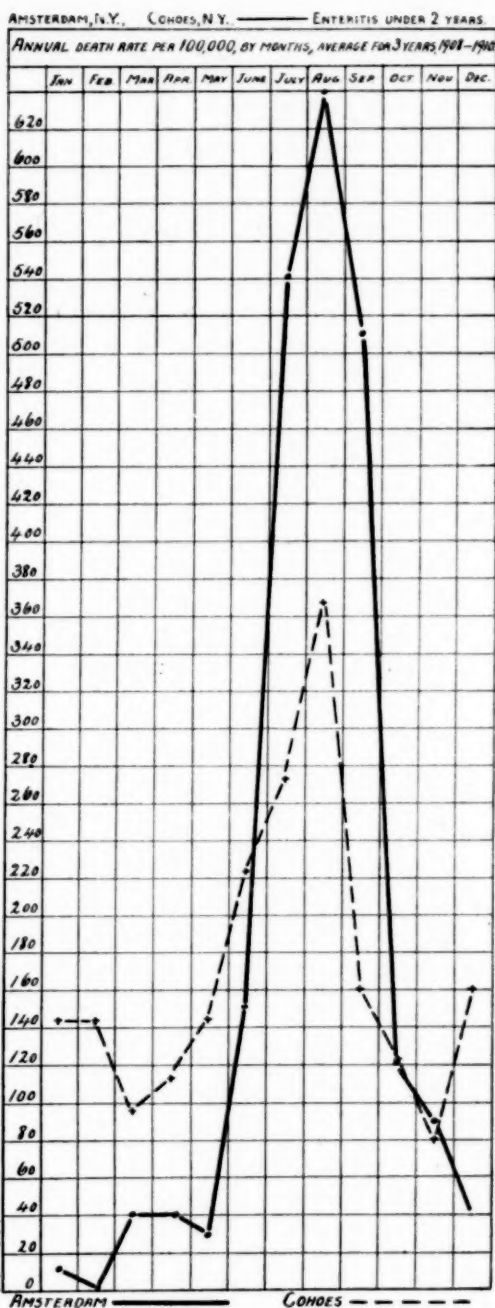


Chart No. 9.

The high rates in the first half of the year and the sharp rise in March are remarkable. Compare this March rise with that of Chicago and Milwaukee in the same months. (Chart No. 15.) The similarity is striking, in view of the similarity in the character of their water supplies.

Chart 16 shows the average rate for six years in the city of Alpena compared with the rate for the entire State of Michigan. Not only is the annual rate for Alpena excessive, but the very high rates in the first half of the year and especially the peak for May are noticeable

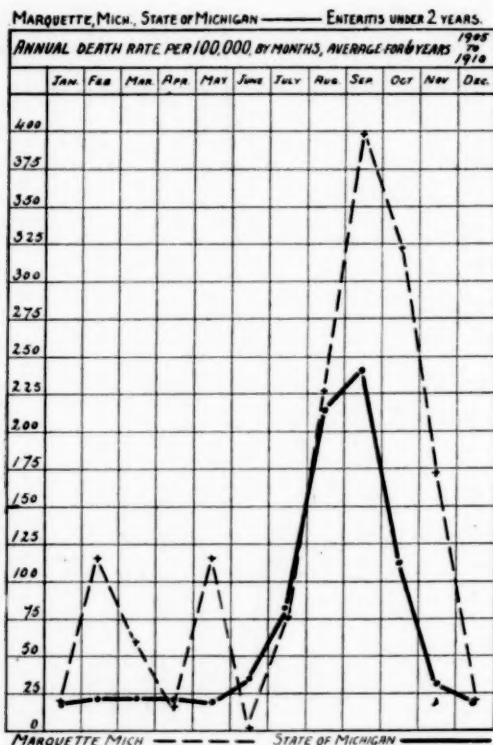


Chart No. 10.

features of this chart. Alpena uses an unfiltered and polluted water supply.

Chart 17 shows the average rate for diarrhea and enteritis in Escanaba, Mich., for six years by months. The chart speaks for itself. Escanaba has been notorious for its polluted water supply and outbreaks of "winter cholera" and typhoid fever.

In 1910 a mechanical filter plant was in operation in Escanaba. Its operation was not entirely satisfactory, but it seemed to have a marked effect upon the typhoid-fever rate and winter enteritis of children in the winter and spring of 1910.

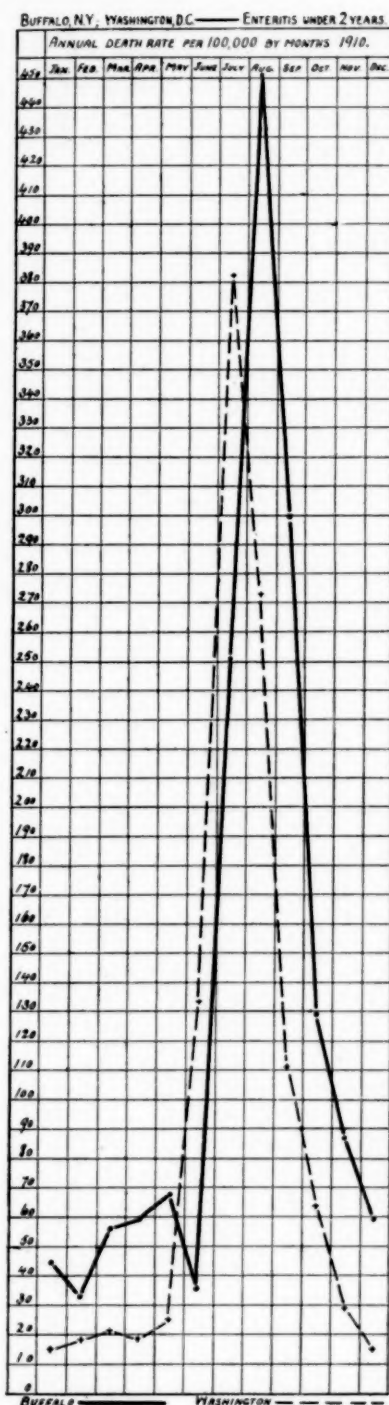


Chart No. 11.

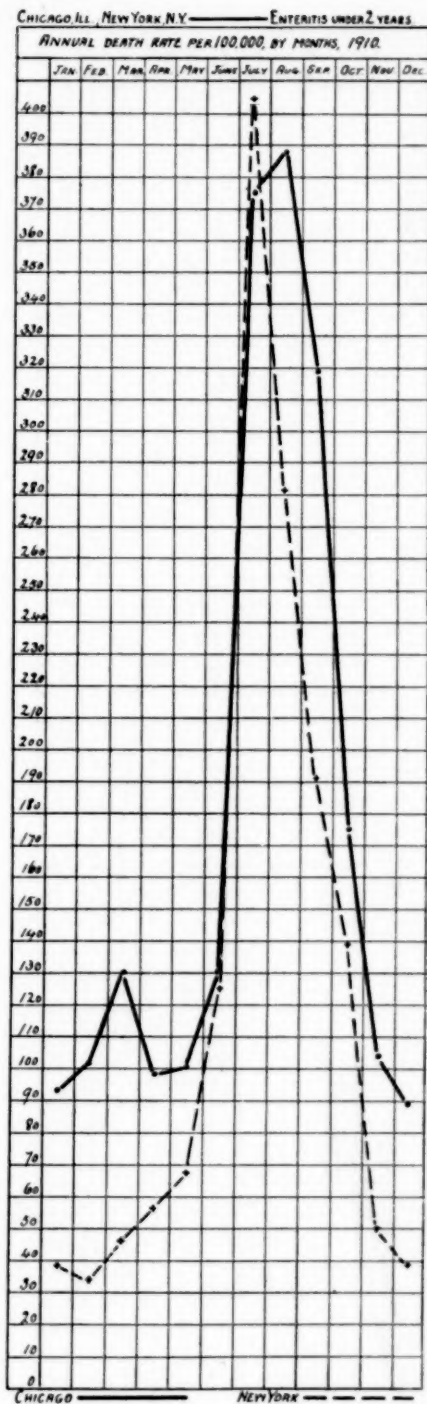


Chart No. 12.

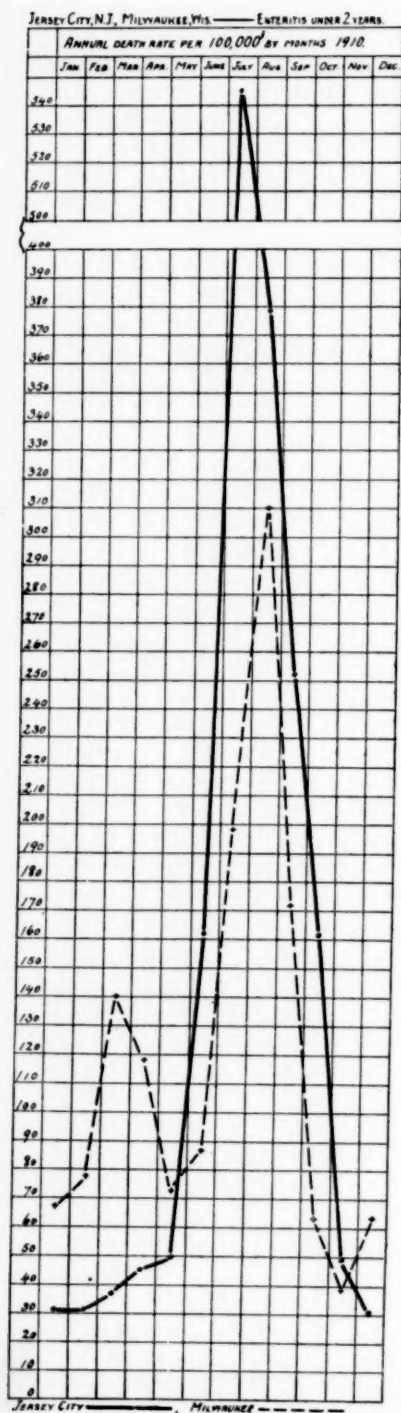


Chart No. 13.

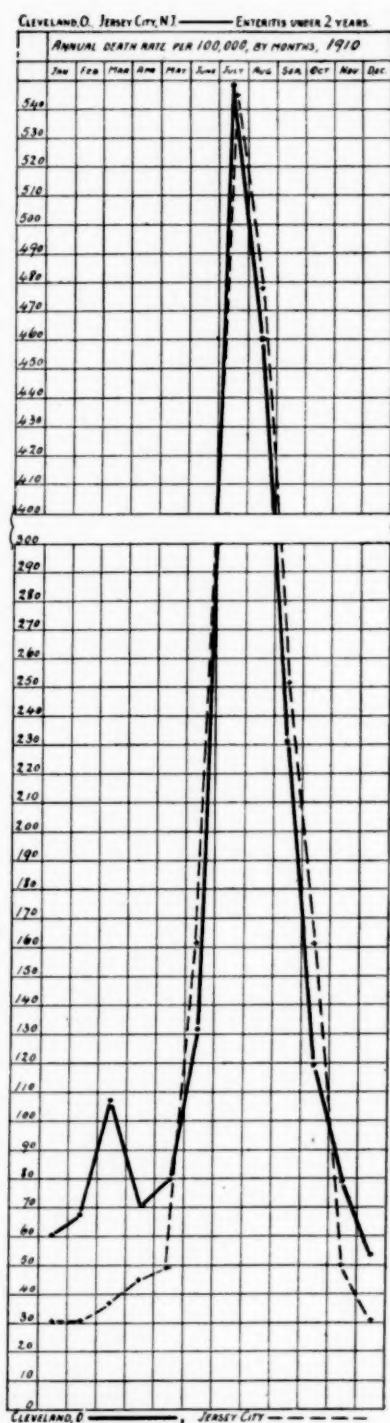


Chart No. 14.



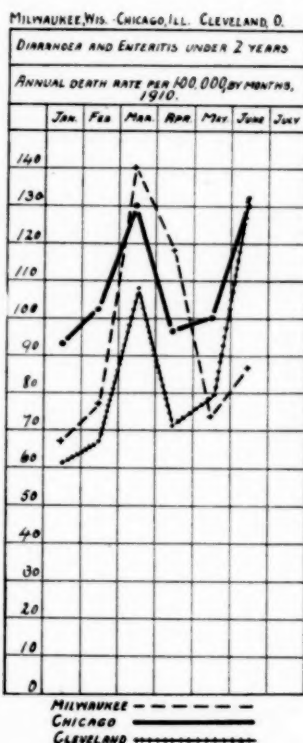


Chart No. 15.

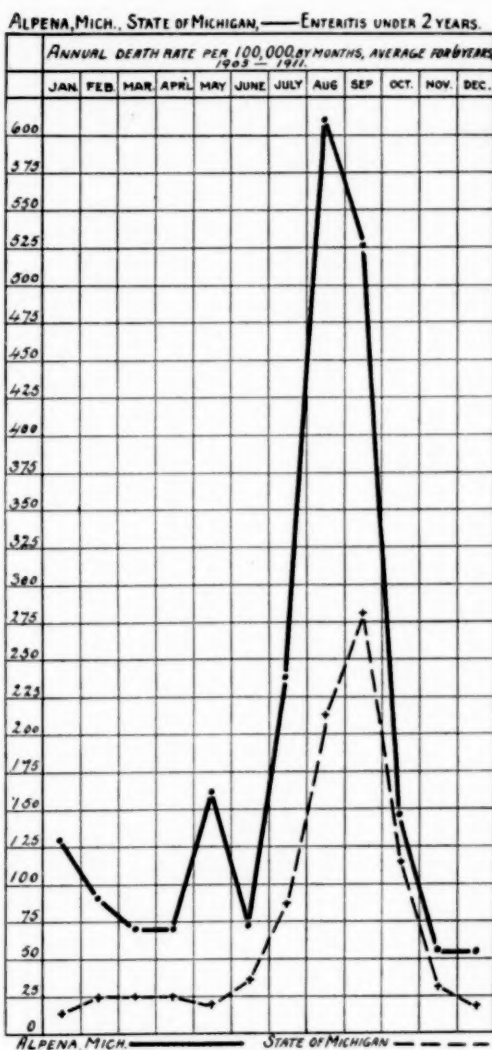


Chart No. 16.

The following table shows the reductions which occurred in the general death rate, the typhoid rate, and the enteritis rate in 1910, following the use of filtered water.

TABLE NO. 15.—*Escanaba, Mich.*

| Year.     | Death rate per 1,000 inhabitants. | Total deaths. | Typhoid-fever deaths. | Enteritis under 2 years; deaths January to June. |
|-----------|-----------------------------------|---------------|-----------------------|--|
| 1908..... | 18                                | 228           | 12                    | 7  |
| 1909..... | 16.8                              | 213           | 28                    | 7  |
| 1910..... | 15.5                              | 206           | 8                     | 1  |

## THE RELATION OF TYPHOID FEVER TO DIARRHEA AND ENTERITIS.

There is a close relation between the curves for typhoid fever and diarrhea and enteritis in many cities, especially in the winter and spring months. This relation is usually disturbed by the sudden rise of the enteritis curve in June or July while the typhoid rise is usually a month later, and not so high.

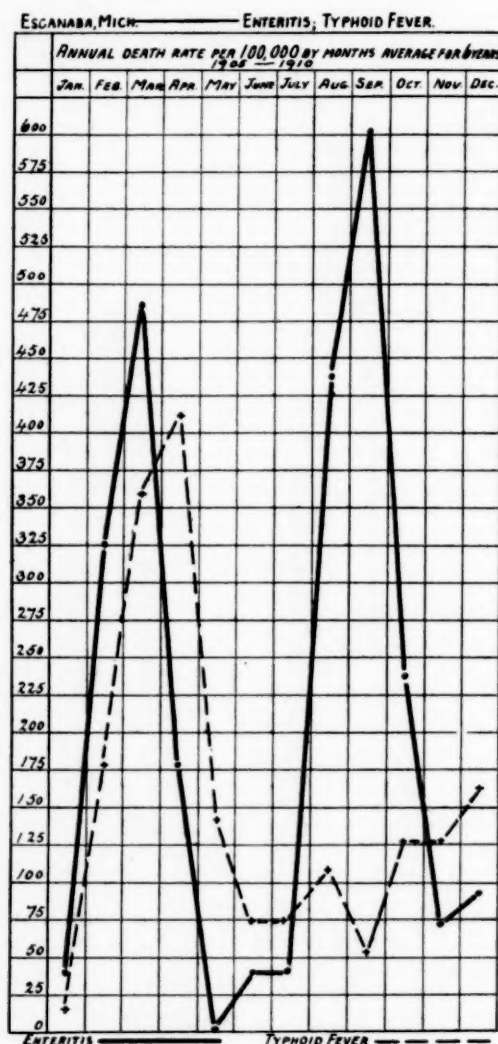


Chart No. 17.

Chart No. 17 shows the relation between the curves for enteritis and typhoid fever by months in Escanaba, Mich., taking an average for six years. Note the abnormally high peaks for both diseases in the spring months and that the spring speak for typhoid is one month later than the pronounced enteritis peak in March. Chart No. 18 shows the curves for typhoid and enteritis compared in Washington,

D. C. Washington has a safe water supply and the rates from January to June for both enteritis and typhoid are low. The close relation between the two curves is apparent.

Chart No. 19 shows the same comparison made in Battle Creek, Mich. Battle Creek's water supply is not above suspicion. Enteritis

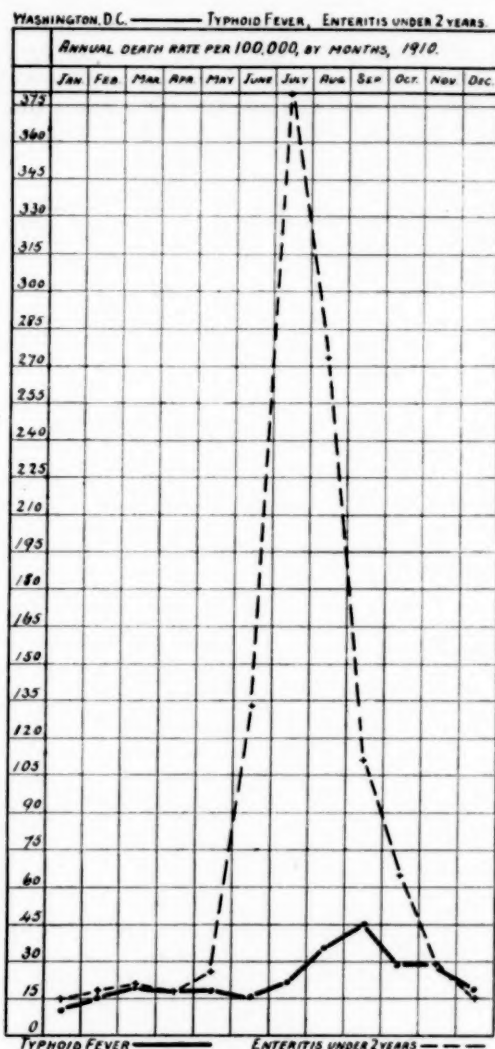


Chart No. 18.

and typhoid fever show synchronous peaks in the curve in January and March.

Pittsburgh in 1910 had a high typhoid-fever rate in the months from January to June. It also had an abnormally high enteritis rate for the same period and a very pronounced peak in March. This relation is shown in chart No. 20.

Milwaukee in 1910 had an unusually high typhoid-fever rate from January to June. The enteritis rate was also very high considering the season, with a pronounced peak in March. Chart No. 21 shows the typhoid and enteritis curves compared in Milwaukee.

Chart No. 22 shows the relation between these curves in Cleveland. The winter and spring typhoid in Cleveland shows a peak in April. The enteritis curve shows a marked rise one month earlier, in March.

Cohoes is another example of very high rates for both typhoid and enteritis in the winter and spring. Chart No. 23 shows the relation between the curves. In addition to the high rates in January, February, March, and April the coincident rise in both curves in December is notable.

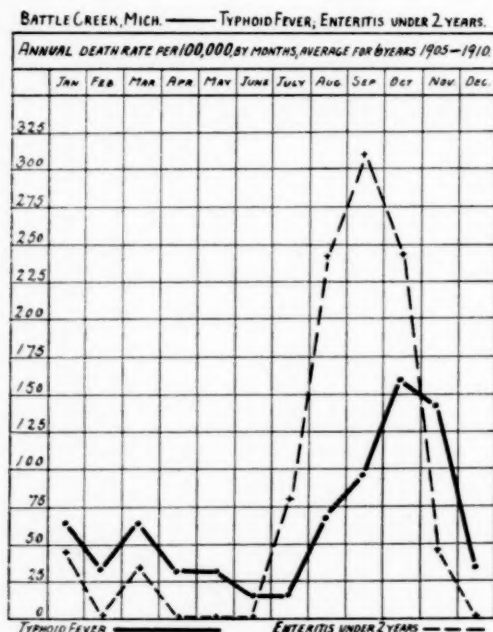


Chart No. 19.

Chart No. 24 shows the curves for typhoid fever and enteritis compared in Niagara Falls. The winter peak for typhoid is pronounced and one month later than the peak for enteritis. On the other hand the rise in May is synchronous and the two curves drop almost together in June.

The relation between enteritis in children and typhoid fever can not be said to be clear. Certain facts, however, stand out prominently in studying the statistics. In cities which are too small to have slums and which have abnormally high typhoid-fever rates there is also an excessive mortality from enteritis and diarrhea in children under 2 years of age. Cities of the same class with low typhoid rates have comparatively low rates for enteritis and diarrhea of children.

The seasonal prevalence also closely follows that of typhoid. If the excessive typhoid in these cities is due to water then we have a high enteritis rate, not only in the summer and autumn, but also in

the winter and spring months. If the typhoid is independent of the water supply, then the enteritis rate like that of typhoid, will be high in the regular season from July to October and low during the remainder of the year.

The effect of polluted water upon young infants may be indirect as well as direct. The polluted water may be used to dilute milk, to wash milk bottles, or directly as a beverage. Further, the polluted water supply, which causes numerous typhoid cases in cities or towns,

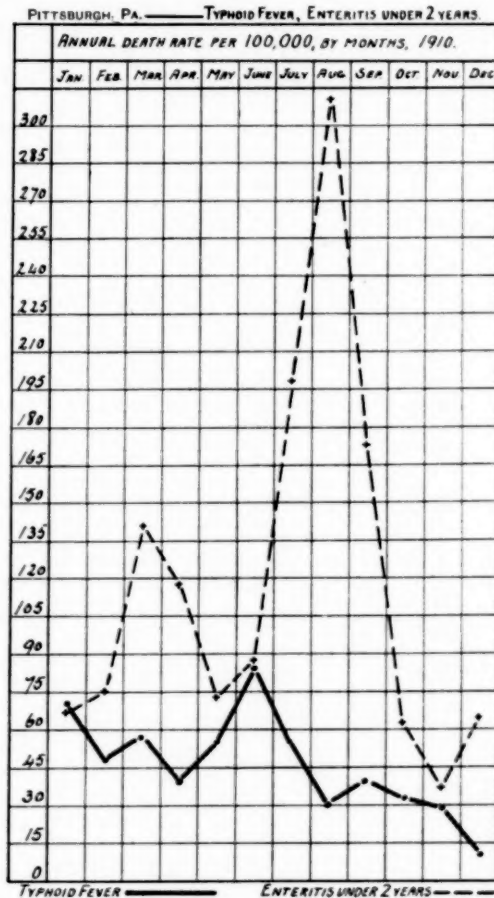


Chart No. 20.

is responsible indirectly for the contact infections in children resulting from such cases. That many of these occur in children can scarcely be doubted, even if they remain undiagnosed as typhoid and enter the statistics as diarrhea or enteritis.

The idea that typhoid fever is not a disease of childhood lacks satisfactory evidence to support it. The mere fact that the bulk of the reported cases is made up of adults is not proof. The writer's experience with cholera,<sup>1</sup> an analogous disease epidemiologically, suggests

<sup>1</sup>McLaughlin, Allan J., "Some observations upon cholera in children," Philippine Journal of Science, sec. B, 1909, vol. 4, p. 363.

that typhoid, like cholera, may be much more frequent in children than popularly supposed, and that a tendency to light or atypical symptoms in children may be expected.

Mere parallelism does not indicate identity of causation. It indicates rather similar modes of transmission and, possibly, identity in a portion of the cases.

Often the unusual prevalence in winter and spring, instead of showing parallelism between the curves, shows that the typhoid peak is

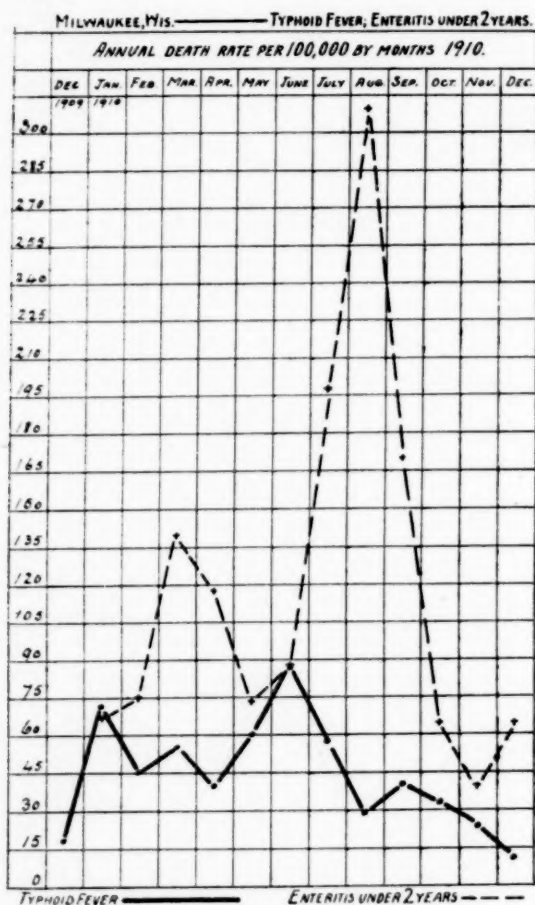


Chart No. 21.

one month later than the peak for enteritis. This same peculiarity is noticeable in the outbreaks of the so-called "winter cholera." After a gross pollution of the water supply by sewage, there follows a sudden massive outbreak of "winter cholera."

This is usually followed about one month later by a typhoid outbreak. The exact causation of winter cholera is obscure. It has nothing to do with season, however, and one of the best examples of this disease occurred at Mackinac Island in August. Whatever the real relation between typhoid fever and enteritis or diarrhea of children may be, one fact is clear, that the same causes operate to cause



CLEVELAND, O. ——— TYPHOID FEVER, ENTERITIS UNDER 2 YEARS

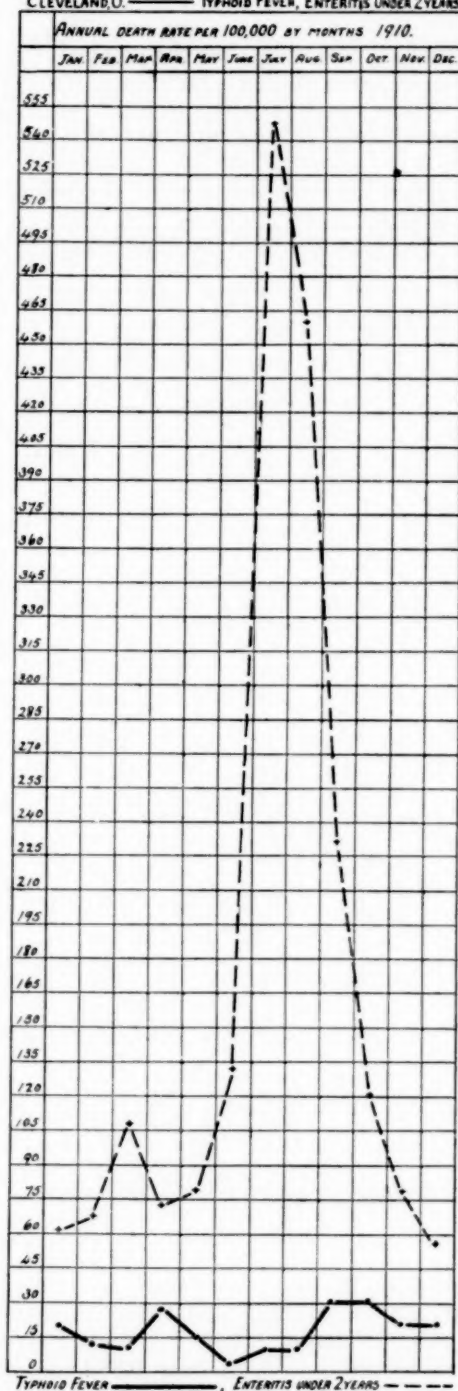


Chart No. 22.

excessive prevalence in both. It is probable that cases of typhoid in children under 2 years in many cities are often diagnosed as enteritis. It must be remembered, however, that the causative agent of bacillary dysentery is transmitted in the same way and by the same media as that of typhoid. There are too many cases of fatal illness in children under 2 years classed as diarrhea and enteritis, and an exhaustive

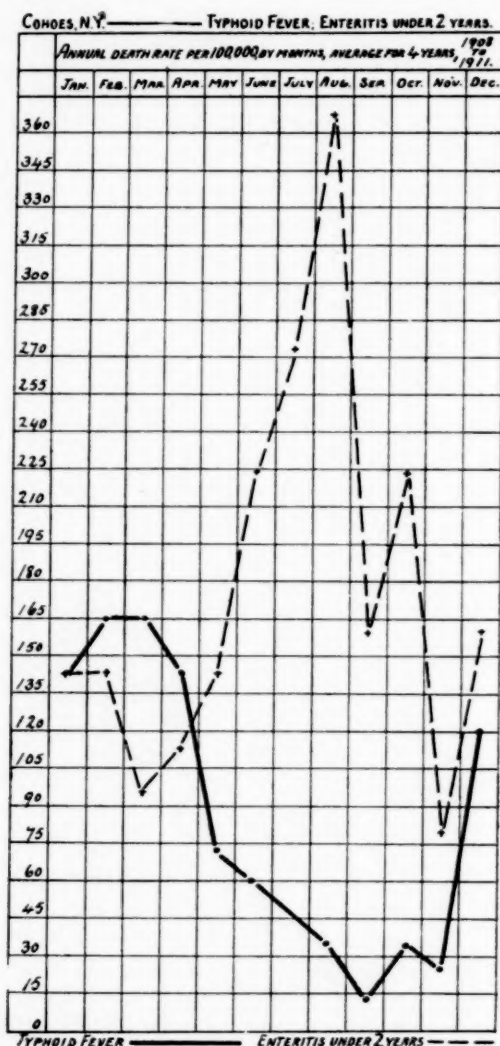


Chart No. 23.

investigation should be made to establish the real cause of death in enteritis and diarrhea of children. Without such an investigation it is impossible to assign the real cause of the excessive child mortality from diarrhea and enteritis. In cities of less than 50,000 population without slums and which are not "mill" towns an enteritis rate in children under 2 years above 100 deaths per 100,000 indicates prevalence of an acute intestinal disease preventable by the same measures

which prevent typhoid fever. It is probable that in such cities proper enforcement of prophylactic measures against typhoid fever would reduce the enteritis rate below 40 deaths per 100,000. Enforcement of prophylactic measures would include the installation of pure water supplies and proper sewerage systems, coupled with a vigorous campaign against the insanitary outdoor privy and the dangerous shallow well.

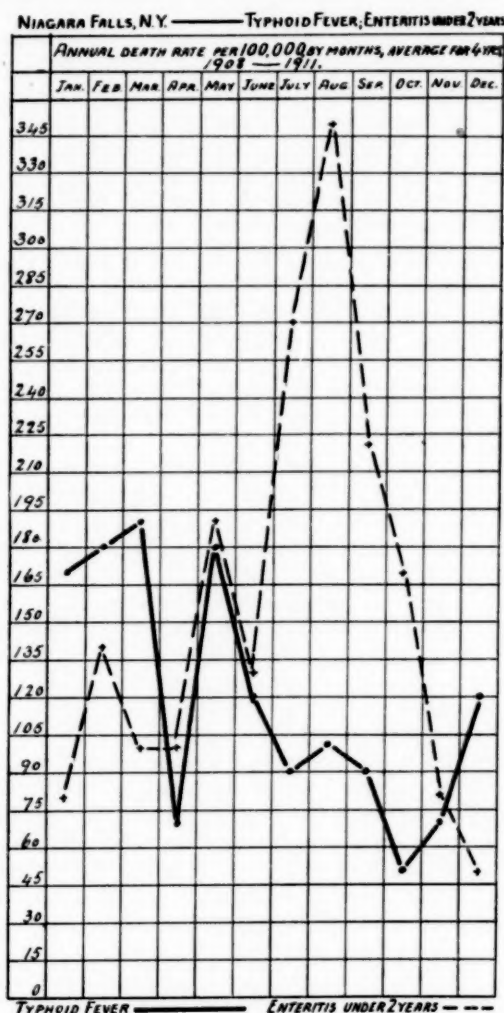


Chart No. 24.

## CONCLUSIONS.

1. From a study of a considerable number of cities it seems probable that the reduction in the general death rate which has been called the Mills-Reineke phenomenon, when present, is due in greatest measure to the reduction in those diseases which are grouped under the heading of diarrhea and enteritis of children.

2. The Mills-Reineke phenomenon and Hazen's theorem are not always apparent after betterment of the public water supply because

of wide fluctuations in the death rates for contagious diseases which are not water borne.

3. Because of the reducing influence on death rates of the campaign against tuberculosis, the improvement in control of milk supplies, the use of diphtheria antitoxin, education of the public in personal hygiene, and the prevention of disease it is difficult to say in some instances to what extent an improved water supply is a factor in the reduction of the general death rate.

It is certain, however, that in practically every instance, in addition to a lessened number of deaths from typhoid fever, the substitution of a safe for a polluted public water supply results in the saving of many lives from diseases which are not reported as typhoid fever.

The question of the identity of these diseases can be answered only after an exhaustive investigation of deaths, and especially of that group of entities which is now reported under the heading of "Diarrhea and enteritis under 2 years."

4. Enteritis or diarrhea in children as a fatal disease may be expected to be excessively prevalent in large cities with slum districts and a large foreign population. The same excessive prevalence may be expected in so-called mill towns, where the mothers are operators in the mills and child neglect is common. Under these conditions the mortality among poor children is very great, but it is almost entirely in the period from July to October, provided the public water supply is safe.

5. In cities with safe water supplies and enteritis rates above the average for the State the ratio of summer and autumn to winter and spring enteritis should be at least 4 to 1, taking the months of June, July, August, September, October, and November for the summer and autumn enteritis, and the months of December, January, February, March, April, and May for the winter and spring enteritis.

6. Cities with grossly polluted water supplies often have a winter and spring enteritis which is more than one-fourth of the summer and autumn enteritis. If such a phenomenon is present each year for several years, it suggests that the polluted water supply is a factor in the enteritis mortality in winter and spring.

7. The relation between typhoid fever and the diarrhea and enteritis of children is not clear. There is often a striking parallelism in seasonal prevalence between the curves, but mere parallelism does not necessarily indicate identity. It may and usually does mean similarity in modes of transmission. Often in the winter and spring months there is a sharp rise in both diseases, the typhoid peak being one month later than that of diarrhea and enteritis.

Cities without slums and with good sanitary conditions except grossly polluted water supplies have excessively high rates for both typhoid fever and diarrhea and enteritis in the winter and spring months. Cities with good water supplies and low typhoid-fever rates may have high rates for diarrhea and enteritis under 2 years, but the rates in winter and spring will be relatively low.

8. Closer cooperation between the practicing physician and the local health departments is necessary in order to carry out an investigation of the true nature of the diarrhea and enteritis in children under 2 years, now classified as diarrhea and enteritis.

9. There should be a wider employment of municipal laboratories by practicing physicians, especially in the diagnosis of typhoid fever and examination of the discharges of sick children.

# UNITED STATES.

## MUNICIPAL ORDINANCES, RULES, AND REGULATIONS PERTAINING TO PUBLIC HYGIENE.

[Adopted since July 1, 1911.]

### COLUMBUS, OHIO.

#### MILK—APPLICATION FOR PERMIT TO SELL.

SEC. 3. (Application for permits.) All applications for permits shall be signed by the applicant, and when received by the dairy inspector shall be placed on file, and the name of such applicant shall be entered in a book of registration kept for such purpose. As soon as possible after an application is received at the health office for a permit to sell milk, the dairy inspector shall visit the dairy or place of business of such applicant, and make such observation and gather such information as will enable the board to properly consider such application. Should the dairy or place of business of such applicant be located more than 80 miles from the city of Columbus he shall either furnish a certificate of qualification of all dairies from which it is proposed milk be obtained, according to the requirements of the sanitary code, made by some State or municipal sanitary authority, acceptable to the board, or pay the cost and expense of making such inspection by the health department; and for such purpose there shall be deposited by said applicant with the clerk of the board an amount sufficient to cover the estimated cost of such inspection, based upon a compensation to the inspector of \$4 per day and the necessary expenses of the inspector in going to and from the place of inspection and while engaged therein; any surplus of said deposit not required for said purposes to be returned to the applicant when the permit is issued; and any deficiency in such amount to be paid by said applicant when the permit is issued.

[Sec 3, Part III, title 1 of the sanitary code as amended Nov. 14, 1911.]

### JACKSON, TENN.

#### MILK—PRODUCTION, CARE, AND SALE.

SECTION 1. No person, firm, or corporation shall produce for sale, sell, offer for sale, or have in his or their charge, custody, or control for sale or distribution within the city of Jackson any milk, cream, or buttermilk without first obtaining a permit from the board of health to conduct such business or distribution, under penalty as hereinafter provided.

SEC. 2. All persons, firms, corporations, or others offering for sale milk, cream, or buttermilk shall apply for and obtain from the board of health a permit for such purpose, and shall at all times keep such permit conspicuously displayed in their place of business.

SEC. 3. All permits for the sale of milk, cream, or buttermilk shall be renewed on or before the 20th day of January of each year, and for each milk permit thus issued the board of health shall collect before issuing such permit a fee of \$1, acknowledgment of the receipt of which shall appear upon the face of said permit when issued.

All permits thus issued or renewed shall be good and in force until the 20th day of January next ensuing. Permits thus issued are not transferable by reason of sale or transfer of business nor is any of the said fee to be refunded by reason of cessation of sale of milk or of any of its products prior to termination of period for which said permit is issued.

All fees thus collected by the board of health for the issuance of such permits shall be paid monthly by the said board of health to the city recorder, and his receipt for same shall be a voucher for the payment of such to the city.

SEC. 4. All milk wagons or other vehicles used for the purpose of vending milk shall have painted thereon legibly the name of the owner in letters not less than 3 inches in



height and shall have placed on each side of wagon or other vehicle used for the purpose of vending milk the license plate of the board of health.

SEC. 5. *Revoking of permit.*—If at any time after the granting of a permit as above provided, the holder fails to comply with the sanitary requirements of the board of health or repeatedly sells or offers for sale milk below standard or otherwise adulterated within the meaning of the ordinances of the city of Jackson or in violation of this ordinance or any of the provisions thereof, the board of health shall revoke his or their permit, with or without notice, and no liability shall attach to the city of Jackson or to any officer of the board of health by reason of such revocation nor shall the city be required to refund any money for the unexpired term of any such permit. The president of the board of health may grant the defendant a hearing if he deems this necessary.

SEC. 6. *Reissuing of revoked permit.*—If, after the revocation of a permit, the defendant complies with the requirements of the board of health and makes manifest his intention to meet them in the future, the president of the board of health may, at his discretion, recommend that the permit be reissued.

SEC. 7. *Publishing standing of dairymen and milk dealers.*—It shall be the duty of the board of health to publish from time to time in the daily newspapers of the city of Jackson the names, score condition of equipment, methods, sanitary condition, and such other data as they may think proper to inform the consuming public of the standing and efficiency of every dealer in milk in the city of Jackson.

SEC. 8. No person, firm, or corporation shall have for sale, sell, offer for sale, or have in his or their charge, custody, or control for sale or distribution within the city of Jackson any unwholesome, watered, or adulterated milk, or milk known as swill milk, or milk which has been transported or stored in an unclean manner, or milk which contains preservatives or coloring matter, or milk which is produced from cows which are kept or stabled under unhealthy conditions, or which may be diseased, or when drawn from animals three weeks before or after parturition.

SEC. 9. All milk sold or offered for sale in this city shall be the pure, unadulterated product of healthy milch cows, and all milk sold or offered for sale in this city shall contain not less than  $3\frac{1}{2}$  per cent of milk fats nor less than 12 $\frac{1}{2}$  per cent of natural milk solids, viz, fat, casein, milk sugar, and ash, and not more than 87 $\frac{1}{2}$  per cent of water, and the specific gravity at 60° F. shall not be lower than 1.029 or higher than 1.034. All milk which shall be below such standard shall be deemed and conclusively held to be impure and adulterated, and if any person shall sell or have for sale milk of a quality below the standard herein established, they shall, upon conviction thereof, be fined not less than \$5 nor more than \$25 for each offense, and upon a second conviction the board of health is hereby empowered to cancel permit held by person or persons thus convicted.

It is further provided that the foregoing shall not be construed to prohibit the sale of buttermilk or skim milk as such, but it is hereby provided that any person or persons selling or having for sale "skim milk" (milk deprived of all or a part of its cream) shall have the can or vessel containing the same labeled prominently and conspicuously, in plain letters not less than 3 inches in height, with the words "skim milk."

SEC. 10. Any person engaged in the sale of milk shall furnish forthwith, when requested to do so by the board of health or any officer or inspector thereof, a true statement in writing, upon blanks to be provided by the board of health, setting forth the locality from which the milk was procured, also a complete and full list of the persons from which said milk was purchased. Said written statement shall be signed by the person or persons selling the said milk.

SEC. 11. No milk, cream, or butter milk shall be sold or exposed for sale in the city of Jackson except from cows stabled under light, dry, and well-ventilated conditions, and in all other respects conforming to the requirements set forth in the following rules:

RULE 1. *Milk depots and dairies.*—By a "milk depot" is meant any place, house, or room where milk is received from the dairy or dairies, and includes all ice-cream factories, and prepared for distribution. By a "dairy" is meant any place where cattle are kept for the production of milk.

RULE 2. *Where to be established.*—No milk depot shall be established or maintained in a room or rooms which communicate directly with any living rooms, kitchen, toilet, laundry, or stable or places where animals are kept or slaughtered. No milk depot shall be maintained which communicates in any way with a horse or cow barn, and shall be separated therefrom by an air and odor proof partition or wall. The immediate vicinity of the milk depot, especially within 25 feet of the doors and windows thereof, shall be kept free from accumulations of rubbish, garbage, manure, and any other putrefying, decomposing, infectious, and bad-smelling substances.

No dairy shall be established or maintained in insanitary surroundings where it is designed to offer such milk to the citizens of Jackson. Insanitary conditions will be



deemed to exist whenever and wherever properly constructed barns, milk rooms, and utensils are not provided; where the cattle are dirty, unhealthy, crowded, fed distillery waste, slop, or other food forbidden by the ordinances of the city of Jackson; where the utensils are not kept clean; where the premises are not kept clean; where the udders of all cows are not washed in clean water and dried with clean cloths prior to milking; where the attendants do not wash and put on a clean outer garment prior to milking; where the milk is not immediately removed from the barn to the milk room immediately after milking each cow, and there promptly cooled; where floors of impervious material are not provided in milk rooms and stables; where screens are not provided; and where the owner refuses to permit an inspection of his premises, or who refuses to cooperate with the board of health.

**RULE 3. Construction.**—The floors in dairies, stables, milk rooms, and milk depots shall be smooth, free from crevice and defects, and water-tight and constructed of some impervious material. The walls and ceilings shall be smooth, tight, and free from unnecessary projections, niches, etc., and kept well painted or whitewashed. The milk room shall be provided with glass windows, proper cooling tanks for the milk, smooth and tight walls and ceilings, and must be screened between April 1 and November 15 each year, as must be all milk depots.

**RULE 4. Ventilation.**—All milk depots and milk rooms shall be provided with adequate ventilation by means of windows, air shafts, air ducts, and other mechanical apparatus, if required, so as to insure free circulation of fresh air at all times.

**RULE 5. Refrigerator and ice boxes.**—The inner wall of the compartment of the refrigerator and ice boxes where milk is kept shall be smooth and metal, or porcelain lined. The milk department shall be kept clean and free from any odor. Nothing but milk and milk products shall be stored in the ice box. This applies to all groceries and meat markets handling milk, as well as to depots and dairies.

**RULE 6. Drying racks.**—Drying racks shall be provided on which bottles and cans can be placed in an inverted position for proper drainage.

**RULE 7. Pasteurizers and separators.**—Pasteurizers and separators shall be so constructed that all parts, including pipes, can be readily cleansed and sterilized. These appliances must be kept scrupulously clean, inside and out, at all times.

**RULE 8. Utensils.**—All shipping cans, bottles, dippers, skimmers, measures, strainers, stirrers, and other utensils must be so constructed that all parts are absolutely free from spaces where milk can accumulate or soak in, so that it can not be removed by simple washing. The surface coming in contact with milk, cream, or buttermilk must be smooth and free from excessive rust. All utensils must be kept scrupulously clean, inside and out, at all times. All utensils before use must be thoroughly sterilized by boiling water or live steam. Utensils must be kept in good repair and free from rough surfaces of any kind. When not in use, they shall be kept dry, inverted, and on racks or hooks where flies can not reach them. Bottle caps must be kept in clean, covered, dry, and dust-proof receptacles.

**RULE 9. Maintenance and care.**—The floors shall be kept clean and scrubbed. The walls, ceiling, shelves, windows, and other surfaces must be clean and free from dust by washing or wiping with damp cloth. Unnecessary articles, such as boxes, old utensils, harness, lanterns, and other articles not required in the milk business shall not be kept in a milk depot or milk room, or in the cow stables.

**RULE 10. Attendants.**—Every person in charge of such milk depot or dairy shall keep himself and his employees in a clean condition and cleanly clothed while engaged in the bottling, pouring, or other handling of milk, including milking of the cows.

**RULE 11. Communicable diseases.**—No person with tuberculosis, any venereal disease, or any communicable disease shall work in any milk depot, dairy, or in any other place where milk or its products are handled. When typhoid fever, scarlet fever, diphtheria, smallpox, tuberculosis, measles, or chicken pox occur in the house or families of anyone engaged in the handling of milk it shall be the duty of the owner or manager to notify the board of health at once of this fact, so that the necessary regulations can be enforced, in cooperation with the board of health, to prevent the spread of the disease. No one afflicted with or convalescent from typhoid fever, scarlet fever, diphtheria, smallpox, measles, or any other communicable disease shall engage in the handling of milk, cream, or buttermilk, nor enter a depot or dairy during such period. When any of the above-enumerated or any other communicable diseases exist in the house or family of anyone engaged in the handling of milk, he shall at once discontinue his work in the milk depot, dairy, or on their vehicles. The depot, dairy, or wagon shall be declared infected if anyone with or convalescent from any of the above-enumerated diseases or any other communicable disease has worked therein or thereon, together with all milk, cream, or buttermilk with which any such party may have come in contact. No person convalescent from any communicable disease or living in any house or on any premises where any communicable disease exists shall reengage in the handling of milk unless the board of health has enforced suitable

quarantine regulations and the necessary disinfection has been done under the supervision and direction of the board of health. No milk dealer or his or her employees shall take from a quarantined house any money, tickets, cans, containers, etc.

**RULE 12. Operation.**—All milk shall be stored at a temperature not above 50° F. Sour milk must not be allowed to stand in the dairyman's cans. Nothing except milk, cream, or buttermilk shall be permitted in the milk vats, ice boxes, and coolers. Returned empty bottles and other utensils must be thoroughly cleansed and sterilized before being conveyed into the milk room.

**Sec. 12.** The board of health may through its duly authorized officers or inspectors visit, view, and inspect all vessels, cans, receptacles, refrigerators, buildings, platforms, establishments, or places of any kind containing milk or its products and examine the conditions thereof with reference to cleanliness and sanitation and cause the removal and abatement of any unfit, unclean, or injurious condition attending the keeping, storing or possession, care, custody or control of milk or its products at any and in all places; and said board of health through its authorized officers or inspectors shall have the right and power to enter and have full access to any building or premises where any milk or its products are stored or kept for sale, and to all wagons, railroads, cars, or vehicles used for the purpose of delivering milk or its products, and shall have the right to remove samples of such milk or its products therefrom for the purpose of inspecting, testing, or analyzing same.

**SEC. 13.** That any person or persons violating any of the sections of this ordinance or section or part thereof of the rules and regulations of the board of health, shall upon conviction be judged guilty of a misdemeanor, and shall be fined not less than \$5 nor more than \$25 for each offense.

**SEC. 14.** That all ordinances or parts of ordinances in conflict with this ordinance be, and the same are hereby, repealed.

**SEC. 15.** That this ordinance take effect from and after its passage, the welfare of the city requiring it.

[Ordinance passed Dec. 14, 1911.]

#### LOS ANGELES, CAL.

**MILK**—NO MILK TO BE SOLD OR OFFERED FOR SALE OR EXCHANGE EXCEPTING THAT COMING FROM COWS WHICH HAVE GIVEN A SATISFACTORY NEGATIVE TUBERCULIN TEST.

**SECTION 1.** It shall be unlawful for any person, firm, or corporation to bring or receive, or to cause or permit to be brought or received into the city of Los Angeles for sale, or to sell, exchange, or deliver, or to offer for sale, exchange, or delivery, or to cause or permit to be sold, exchanged, or delivered, or to be offered for sale, exchange, or delivery, or to have in possession for sale, exchange, or delivery any milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk, unless such milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk be obtained from cows that have given a satisfactory negative tuberculin test, as hereinafter provided: *Provided, however,* That the provisions of this section shall not apply to condensed or evaporated milk or condensed or evaporated skimmed milk which is sterilized and is contained in hermetically sealed packages labeled with the name of the article and with the name of the person, firm, or corporation by whom the same is prepared.

**SEC. 2.** Every cow or bull and all young stock shall be considered tubercular if following an injection of tuberculin any such cow, bull, or young stock shall exhibit a temperature, within 24 hours after such injection, of or exceeding 103.8° by the Fahrenheit thermometer, or which shall exhibit a temperature, within 24 hours after such injection, of or exceeding 2° by the Fahrenheit thermometer higher than the temperature of such cow, bull, or young stock recorded prior to the injection of such tuberculin. Said tuberculin test shall be made in accordance with the rules and regulations prescribed by the United States Bureau of Animal Industry.

**SEC. 3.** Until January 1, 1915, milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk obtained from cows which have not given a satisfactory negative tuberculin test, may be sold within the city of Los Angeles under the following conditions and not otherwise, to wit:

No milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk from cows which have not given a satisfactory negative tuberculin test, shall be sold or offered for sale, exchanged, given away, or delivered within the city of Los Angeles unless such milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or con-

densed or evaporated skimmed milk shall first have been pasteurized in a pasteurizer that is equipped with a self-regulating flowing device and self-recording thermometer, and unless all such milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk shall have exhibited a temperature of not less than 145° by the Fahrenheit thermometer, and shall have been maintained at such temperature for not less than 20 minutes.

SEC. 4. It shall be unlawful for any person, firm, or corporation to bring or receive, or to cause or permit to be brought or received, into the city of Los Angeles for sale, or to give away, sell, or offer for sale or to cause or permit to be sold or offered for sale, or to have in possession for sale, exchange, or delivery therein, any milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk obtained from any cows which have given a satisfactory negative tuberculin test which are permitted to associate or come in contact with any cattle which have exhibited a reaction to the tuberculin test, or to fail, neglect, or refuse to immediately separate and keep separated all cattle which have given a satisfactory negative tuberculin test from cattle which have exhibited a reaction to the tuberculin test.

It shall be unlawful for any such person, firm, or corporation to fail, neglect, or refuse to disinfect any premises where cattle which have exhibited a reaction to the tuberculin test have been kept or from which such cattle have been removed, in such manner and within such time as the health commissioner shall direct.

It shall be unlawful for any such person, firm, or corporation to handle the milk of any cow which has exhibited a reaction to the tuberculin test in any utensils used for the handling of milk of cows which have given a satisfactory negative tuberculin test.

SEC. 5. Every person, firm, or corporation supplying milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk to the city of Los Angeles, or any inhabitant thereof, produced from or by any dairy cattle owned or controlled by such person, firm, or corporation, shall, within 10 days after this ordinance becomes effective, make written application to the health commissioner for the tuberculin test to be applied to such dairy cattle. Such application shall be made annually and shall set forth the number and kind of dairy cattle in possession of or under the control of the applicant. On premises where tubercular cattle have been found and have been removed the remaining cattle shall be subjected to a retest within the period of six months from the time the last test was applied. Dairy cattle to which the tuberculin test has not been applied shall be kept separate from nonreacting dairy cattle until such cattle shall have given a satisfactory negative tuberculin test.

SEC. 6. The tuberculin test required to be made under the provisions of this ordinance shall be made under the direction of the health commissioner and shall be made free of charge.

SEC. 7. All dairy cattle found free from tuberculosis as determined by the tuberculin test shall be marked by placing a metal tag in the right ear; such tag shall bear the following inscription, L. A. T. T. No. ——. All dairy cattle affected with tuberculosis as determined by a reaction to the tuberculin test shall be marked by punching out of the right ear the letter T, such letter to be not less than 1½ inches in height and 1½ inches in width, or by branding with a branding iron such letter T in the middle of the forehead.

SEC. 8. The health commissioner shall designate the time and place where herds of 10 dairy cattle or less shall be presented to have the tuberculin test applied.

SEC. 9. It shall be unlawful for any person other than the health commissioner or his regularly appointed assistants, deputies, or inspectors, or inspectors of the United States Bureau of Animal Industry, or the State veterinarian or his assistants, deputies, or inspectors to place, attach, or apply any tag or brand of the kind or character described in section 7 of this ordinance.

SEC. 10. Nothing in this ordinance contained shall be deemed to prevent the health commissioner from applying the ophthalmic test in addition to the subcutaneous test.

SEC. 11. That any person, firm, or corporation violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punishable by a fine of not more than \$500 or by imprisonment in the city jail for a period of not more than six months, or by both such fine and imprisonment.

SEC. 12. The city clerk shall certify to the passage of this ordinance and cause the same to be published once in the Los Angeles Daily Journal.

[Ordinance adopted Nov. 28, 1911.]

**ORANGE, N. J.**

**MILK AND ICE CREAM—PRODUCTION, CARE, AND SALE.**

2. No milk shall be sold, delivered, stored, or transported at a temperature exceeding 50° F.

3. Every license required under section 27 of the ordinance to which this ordinance is a supplement shall, when said license applies to the sale of milk from a store or booth, be plainly displayed at all times in or upon said store or booth.

4. No milk shall hereafter be sold or offered for sale or delivered within the city of Orange which shall be produced in dairies having a rating below 60 per cent, as based on the score card adopted by the board of health of the State of New Jersey, or which contains an excessive number of bacteria.

5. No person shall issue, circulate, or use milk tickets or coupons that have been previously used, and no person having custody of a milk can, bottle, or other vessel used as a container for milk intended for sale or distribution, shall place or permit to be placed therein any milk ticket or any other article or substances other than milk or its products or water or other agent used for cleansing such bottle, can, or vessel.

6. No cream shall be sold or offered for sale or delivered within the city of Orange unless it shall be produced and handled in accordance with the requirements set forth in the ordinances and regulations of this board in relation to the production and handling of milk.

7. No ice cream shall be manufactured, sold, or offered for sale in the city of Orange unless the milk and cream entering into the composition of the same shall comply with all requirements set forth in the ordinances and regulations of this board and of the board of health of the State of New Jersey.

[Ordinance, board of health, adopted Oct. 2, 1911, as a supplement to the sanitary and plumbing code adopted Dec. 1, 1900.]

# CEREBROSPINAL MENINGITIS.

## CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APRIL 6, 1912.

| City.              | Cases. | Deaths. | City.                | Cases. | Deaths. |
|--------------------|--------|---------|----------------------|--------|---------|
| Baltimore, Md.     |        | 3       | New Orleans, La.     | 3      | 4       |
| Boston, Mass.      | 1      | 1       | Newport, Ky.         | 1      |         |
| Bridgeport, Conn.  |        | 1       | New York, N. Y.      | 8      | 11      |
| Chicago, Ill.      | 2      | 1       | Norristown, Pa.      |        | 1       |
| Cincinnati, Ohio.  | 2      |         | Oakland, Cal.        |        | 1       |
| Cleveland, Ohio.   |        | 1       | Oklahoma City, Okla. | 2      |         |
| Denver, Colo.      | 1      | 1       | Omaha, Nebr.         | 5      | 3       |
| Fall River, Mass.  | 1      | 1       | Philadelphia, Pa.    |        | 1       |
| Galveston, Tex.    | 3      | 1       | Racine, Wis.         |        | 1       |
| Haverhill, Mass.   | 4      |         | Roanoke, Va.         | 3      | 2       |
| Jacksonville, Fla. | 1      | 1       | St. Louis, Mo.       | 6      | 1       |
| Kansas City, Kans. | 17     |         | San Antonio, Tex.    | 5      |         |
| Kansas City, Mo.   | 24     | 26      | Springfield, Ill.    |        | 1       |
| Lexington, Ky.     | 1      |         | Wilmington, Del.     |        | 1       |
| Malden, Mass.      |        | 1       | Worcester, Mass.     |        | 1       |
| Nashville, Tenn.   | 12     | 1       |                      |        |         |

### OKLAHOMA.

From December 1, 1911, to March 27, 1912, 415 cases of cerebrospinal meningitis with 159 deaths were reported in the State of Oklahoma. Of these 133 cases with 38 deaths were reported from February 29 to March 27. The cases were reported from 51 counties.

### ERYSIPELAS.

## CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APR. 6, 1912.

| City.              | Cases. | Deaths. | City.             | Cases. | Deaths. |
|--------------------|--------|---------|-------------------|--------|---------|
| Baltimore, Md.     |        | 2       | Lynn, Mass.       |        | 1       |
| Camden, N. J.      | 1      |         | Montclair, N. J.  | 2      |         |
| Cincinnati, Ohio.  | 1      |         | New York, N. Y.   | 30     | 13      |
| Cleveland, Ohio.   | 6      |         | Norristown, N. J. | 1      |         |
| Cumberland, Md.    | 1      |         | Philadelphia, Pa. | 15     |         |
| Haverhill, Mass.   | 1      |         | Providence, R. I. |        | 1       |
| Jersey City, N. J. |        | 1       | Reading, Pa.      | 1      |         |
| Kalamazoo, Mich.   | 1      |         | Saginaw, Mich.    | 1      | 1       |
| Los Angeles, Cal.  | 4      | 1       | St. Louis, Mo.    | 14     | 3       |



## PLAGUE-PREVENTION WORK.

## DISTRIBUTION OF POISON.

In connection with the making and maintenance of a squirrel-free zone around the cities of California on San Francisco Bay, 2,998 acres of land in Alameda County were covered with poison during the week ended April 6, 1912.

## RECORD OF PLAGUE INFECTION.

| Places.                                      | Date of last case of human plague. | Date of last case of rat plague. | Date of last case of squirrel plague. | Total number of rodents found infected since May, 1907. |
|--|------------------------------------|----------------------------------|---------------------------------------|---|
| California:                                  |                                    |                                  |                                       |   |
| Cities—                                      |                                    |                                  |                                       |   |
| San Francisco.....                           | Jan. 30, 1908.....                 | Oct. 23, 1908.....               | None.....                             | 398 rats.   |
| Oakland.....                                 | Aug. 9, 1911.....                  | Dec. 1, 1908.....                | do.....                               | 126 rats.   |
| Berkeley.....                                | Aug. 27, 1907.....                 | None.....                        | do.....                               | None.   |
| Los Angeles.....                             | Aug. 11, 1908.....                 | do.....                          | Aug. 21, 1908.....                    | 1 squirrel.   |
| Counties—                                    |                                    |                                  |                                       |   |
| Alameda (exclusive of Oakland and Berkeley). | Sept. 26, 1909.....                | Wood rat, Oct. 17, 1909.         | Oct. 9, 1911.....                     | 114 squirrels and 1 wood rat.                           |
| Contra Costa.....                            | July 21, 1911.....                 | None.....                        | Sept. 23, 1911.....                   | 364 squirrels.  |
| Fresno.....                                  | None.....                          | do.....                          | Oct. 27, 1911.....                    | 1 squirrel.   |
| Merced.....                                  | do.....                            | do.....                          | July 13, 1911.....                    | 5 squirrels.  |
| Monterey.....                                | do.....                            | do.....                          | Aug. 6, 1911.....                     | Do.   |
| San Benito.....                              | June 5, 1910.....                  | do.....                          | June 8, 1911.....                     | 22 squirrels.   |
| San Joaquin.....                             | Sept. 18, 1911.....                | do.....                          | Aug. 26, 1911.....                    | 18 squirrels.   |
| San Luis Obispo.....                         | None.....                          | do.....                          | Jan. 29, 1910.....                    | 1 squirrel.   |
| Santa Clara.....                             | Aug. 23, 1910.....                 | do.....                          | Oct. 5, 1910.....                     | 23 squirrels.   |
| Santa Cruz.....                              | None.....                          | do.....                          | May 17, 1910.....                     | 3 squirrels.  |
| Stanislaus.....                              | do.....                            | do.....                          | June 2, 1911.....                     | 13 squirrels.   |
| Washington:                                  |                                    |                                  |                                       |   |
| City—  |                                    |                                  |                                       |   |
| Seattle.....                                 | Oct. 30, 1907.....                 | Sept. 21, 1911.....              | None.....                             | 25 rats.  |

## RATS COLLECTED AND EXAMINED FOR PLAGUE INFECTION.

| Places.            | Week ended—  | Total collected.   | Found dead. | Examined. | Found infected. |
|--------------------|--------------|--------------------|-------------|-----------|-----------------|
| California:        |              |                    |             |           |                 |
| Cities—            |              |                    |             |           |                 |
| Berkeley.....      | Apr. 6, 1912 | <sup>1</sup> 139   | 8           | 96        |                 |
| Oakland.....       | do.....      | <sup>2</sup> 738   | 22          | 544       |                 |
| San Francisco..... | do.....      | <sup>3</sup> 1,803 | 20          | 1,395     |                 |
| Washington:        |              |                    |             |           |                 |
| City—              |              |                    |             |           |                 |
| Seattle.....       | do.....      | 1,094              |             | 1,054     |                 |

<sup>1</sup> Identified: *Mus norvegicus*, 104; *Mus musculus*, 35.

<sup>2</sup> Identified: *Mus norvegicus*, 566; *Mus musculus*, 172.

<sup>3</sup> Identified: *Mus norvegicus*, 778; *Mus rattus*, 307; *Mus alexandrinus*, 313; *Mus musculus*, 405.

## SQUIRRELS COLLECTED AND EXAMINED FOR PLAGUE INFECTION.

During the week ended April 6, 1912, 326 ground squirrels from Alameda County, Cal., were examined for plague infection. No plague-infected squirrel was found.



## PNEUMONIA.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES  
FOR THE WEEK ENDED APRIL 6, 1912.

| City.               | Cases. | Deaths. | City.                   | Cases. | Deaths. |
|---------------------|--------|---------|-------------------------|--------|---------|
| Altoona, Pa.        |        | 2       | Montgomery, Ala.        |        | 1       |
| Ann Arbor, Mich.    | 3      |         | Nashville, Tenn.        |        | 7       |
| Auburn, N. Y.       | 4      | 2       | Newark, N. J.           |        | 5       |
| Baltimore, Md.      |        | 24      | New Bedford, Mass.      |        | 6       |
| Berkeley, Cal.      |        | 1       | New Castle, Pa.         | 1      |         |
| Binghampton, N. Y.  | 10     | 3       | New Orleans, La.        |        | 5       |
| Boston, Mass.       |        | 38      | Newton, Mass.           |        | 3       |
| Bridgeport, Conn.   |        | 7       | New York, N. Y.         |        | 137     |
| Cambridge, Mass.    |        | 3       | Niagara Falls, N. Y.    |        | 3       |
| Chelsea, Mass.      |        | 1       | Norristown, Pa.         |        | 2       |
| Chicopee, Mass.     |        | 2       | Northampton, Mass.      |        | 1       |
| Chicago, Ill.       | 41     | 147     | Oakland, Cal.           |        | 3       |
| Cincinnati, Ohio.   |        | 12      | Oklahoma, Okla.         |        | 2       |
| Cleveland, Ohio.    | 27     | 7       | Omaha, Nebr.            |        | 6       |
| Cumberland, Md.     |        | 2       | Pasadena, N. J.         |        | 4       |
| Danville, Ill.      |        | 2       | Pawtucket, R. I.        |        | 4       |
| Dayton, Ohio.       |        | 1       | Philadelphia, Pa.       | 39     | 53      |
| Duluth, Minn.       |        | 1       | Pittsfield, Mass.       |        | 3       |
| Dunkirk, N. Y.      | 1      | 1       | Pottstown, Pa.          |        | 3       |
| East Orange, N. J.  |        | 3       | Providence, R. I.       |        | 8       |
| Elmira, N. Y.       |        | 2       | Racine, Wis.            |        | 2       |
| El Paso, Tex.       |        | 6       | Reading, Pa.            | 1      | 1       |
| Evansville, Ind.    |        | 3       | Roanoke, Va.            |        | 2       |
| Everett, Mass.      |        | 2       | Rockford, Ill.          |        | 1       |
| Fall River, Mass.   |        | 9       | Saginaw, Mich.          | 2      |         |
| Grand Rapids, Mich. | 2      | 3       | Salem, Mass.            |        | 7       |
| Harrisburg, Pa.     | 4      |         | San Antonio, Tex.       |        | 1       |
| Hartford, Conn.     |        | 7       | San Diego, Cal.         | 1      |         |
| Haverhill, Mass.    | 8      |         | Saratoga Springs, N. Y. | 3      |         |
| Homestead, Pa.      | 2      | 2       | Schenectady, N. Y.      | 11     | 4       |
| Kalamazoo, Mich.    | 2      | 2       | South Bend, Ind.        |        | 5       |
| Kansas City, Kans.  | 14     | 14      | South Bethlehem, Pa.    | 1      |         |
| Knoxville, Tenn.    |        | 1       | Spokane, Wash.          |        | 1       |
| La Fayette, Ind.    |        | 2       | Springfield, Ill.       |        | 4       |
| Lancaster, Pa.      | 1      |         | Springfield, Mass.      |        | 9       |
| Lawrence, Mass.     |        | 4       | Taunton, Mass.          |        | 2       |
| Los Angeles, Cal.   | 1      | 9       | Toledo, Ohio.           |        | 5       |
| Lowell, Mass.       |        | 2       | Washington, D. C.       |        | 19      |
| Lynchburg, Va.      |        | 1       | Wheeling, W. Va.        |        | 4       |
| Lynn, Mass.         |        | 3       | Wilkes-Barre, Pa.       | 4      | 4       |
| Manchester, N. H.   | 7      | 7       | Wilkesburg, Pa.         | 1      |         |
| Marquette, Wis.     |        | 3       | Wilmington, Del.        |        | 5       |
| Medford, Mass.      |        | 2       | Wilmington, N. C.       | 5      | 3       |
| Moline, Ill.        |        | 1       | Zanesville, Ohio.       |        | 2       |
| Montclair, N. J.    |        | 1       |                         |        |         |

## POLIOMYELITIS.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES  
FOR THE WEEK ENDED APRIL 6, 1912.

| City.            | Cases. | Deaths. | City.             | Cases. | Deaths. |
|------------------|--------|---------|-------------------|--------|---------|
| Boston, Mass.    |        | 1       | Los Angeles, Cal. |        | 1       |
| Lancaster, Pa.   | 1      |         | Lowell, Mass.     | 1      |         |
| Logansport, Ind. |        | 1       | New York, N. Y.   | 2      | 1       |

## TETANUS.

During the week ended April 6, 1912, tetanus was reported as follows: Chicago, Ill., 1 death; New York, N. Y., 2 deaths; Philadelphia, Pa., 1 case.

## SMALLPOX IN THE UNITED STATES.

In the following table the States indicated by an asterisk are those from which reports of smallpox are received only from certain city, and in some cases county, boards of health. In these States, therefore, the recorded cases and deaths should not be taken as showing the general prevalence of the disease. In the States not marked by an asterisk the reports are received monthly from the State boards of health and include all cases reported to the State authorities.

## REPORTS RECEIVED DURING WEEK ENDED APR. 26, 1912.

| Places.                   | Date.          | Cases. | Deaths. | Remarks. |
|---------------------------|----------------|--------|---------|----------|
| District of Columbia..... | Apr. 7-13..... | 1      |         |          |
| Florida:                  |                |        |         |          |
| Counties—                 |                |        |         |          |
| Alachua.....              | Apr. 1-6.....  | 2      |         |          |
| Duval.....                | do.....        | 5      |         |          |
| Escambia.....             | do.....        | 1      |         |          |
| Hernando.....             | do.....        | 2      |         |          |
| Hillsboro.....            | do.....        | 1      |         |          |
| Polk.....                 | do.....        | 7      |         |          |
| Putnam.....               | do.....        | 4      |         |          |
| Total for State.....      |                | 22     |         |          |
| Kansas:                   |                |        |         |          |
| Counties—                 |                |        |         |          |
| Allen.....                | Feb. 1-29..... | 2      |         |          |
| Cloud.....                | do.....        | 1      |         |          |
| Coffey.....               | do.....        | 2      |         |          |
| Cowley.....               | do.....        | 1      |         |          |
| Crawford.....             | do.....        | 4      |         |          |
| Ford.....                 | do.....        | 1      |         |          |
| Lyon.....                 | do.....        | 4      |         |          |
| Reno.....                 | do.....        | 1      |         |          |
| Woodson.....              | do.....        | 1      |         |          |
| Wyandotte.....            | do.....        | 3      |         |          |
| Total for State.....      |                | 20     |         |          |
| *Louisiana:               |                |        |         |          |
| New Orleans.....          | Apr. 4-11..... | 12     |         |          |
| Montana:                  |                |        |         |          |
| Counties—                 |                |        |         |          |
| Cascade.....              | Mar. 1-31..... | 1      |         |          |
| Chouteau.....             | do.....        | 2      |         |          |
| Fergus.....               | do.....        | 3      |         |          |
| Hill.....                 | do.....        | 1      |         |          |
| Lewis and Clark.....      | do.....        | 1      |         |          |
| Lincoln.....              | do.....        | 4      |         |          |
| Missoula.....             | do.....        | 1      |         |          |
| Silverbow.....            | do.....        | 1      |         |          |
| Teton.....                | do.....        | 3      |         |          |
| Total for State.....      |                | 17     |         |          |
| New Jersey.....           | Mar. 1-31..... |        |         | No case  |
| Oklahoma:                 |                |        |         |          |
| Counties—                 |                |        |         |          |
| Bryan.....                | Feb. 1-29..... | 1      |         |          |
| Delaware.....             | do.....        | 20     |         |          |
| Le Flore.....             | do.....        | 1      |         |          |
| Logan.....                | do.....        | 5      |         |          |
| Muskogee.....             | do.....        | 3      |         |          |
| Osage.....                | do.....        | 30     |         |          |
| Pittsburg.....            | do.....        | 1      |         |          |
| Sequoyah.....             | do.....        | 1      |         |          |
| Tulsa.....                | do.....        | 2      |         |          |
| Total for State.....      |                | 64     |         |          |

## SMALLPOX IN THE UNITED STATES—Continued.

Reports Received during Week ended Apr. 26, 1912.

| Places.                                | Date.          | Cases. | Deaths. | Remarks. |
|--|----------------|--------|---------|----------|
| <b>South Dakota:</b>                   |                |        |         |          |
| <b>Counties—</b>                       |                |        |         |          |
| Brown.....                             | Mar. 1-31..... | 30     |         |          |
| Charles Mix.....                       | do.....        | 2      |         |          |
| Clay.....                              | do.....        | 2      |         |          |
| Corson.....                            | do.....        | 1      |         |          |
| Custer.....                            | do.....        | 25     |         |          |
| Edmunds.....                           | do.....        | 2      |         |          |
| Lincoln.....                           | do.....        | 3      |         |          |
| McCook.....                            | do.....        | 2      |         |          |
| Marshall.....                          | do.....        | 1      |         |          |
| Moody.....                             | do.....        | 1      |         |          |
| Pennington.....                        | do.....        | 1      | 1       |          |
| Roberts.....                           | do.....        | 1      |         |          |
| Spink.....                             | do.....        | 17     |         |          |
| Walworth.....                          | do.....        | 1      |         |          |
| Yankton.....                           | do.....        | 1      |         |          |
| Total for State.....                   |                | 90     | 1       |          |
| Grand total for the United States..... |                | 226    | 1       |          |

## MORBIDITY AND MORTALITY.

MORBIDITY AND MORTALITY TABLE, CITIES OF THE UNITED STATES.  
FOR WEEK ENDED APR. 6, 1912.

| Cities.   | Population<br>United<br>States<br>census<br>1910. | Total<br>deaths<br>from<br>all<br>causes. | Diph-<br>theria. |         | Measles. |         | Scarlet<br>fever. |         | Small-<br>pox. |         | Tuber-<br>culosis. |         | Ty-<br>phoid<br>fever. |         |
|---|---|---|------------------|---------|----------|---------|-------------------|---------|----------------|---------|--------------------|---------|------------------------|---------|
|   |   |   | Cases.           | Deaths. | Cases.   | Deaths. | Cases.            | Deaths. | Cases.         | Deaths. | Cases.             | Deaths. | Cases.                 | Deaths. |
| <i>Cities having over 500,000<br/>inhabitants.</i>            |   |   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Baltimore, Md.....  | 558,485   | 201                                       | 11               | 1       | 19       | 13      | 44                | 29      | 11             | 2       |                    |         |                        |         |
| Boston, Mass.....   | 670,585   | 236                                       | 22               | 2       | 150      | 29      | 68                | 17      | 8              |         |                    |         |                        |         |
| Chicago, Ill.....   | 2,185,283   | 117                                       | 21               | 21      | 142      | 225     | 147               | 106     | 12             | 1       |                    |         |                        |         |
| Cleveland, Ohio.....  | 560,663   | 151                                       | 16               | 5       | 62       | 35      | 21                | 11      | 4              | 1       |                    |         |                        |         |
| New York, N. Y.....   | 4,766,883   | 1,691                                     | 298              | 30      | 1,879    | 501     | 409               | 308     | 31             | 3       |                    |         |                        |         |
| Philadelphia, Pa.....   | 1,549,008   | 482                                       | 40               | 8       | 30       | 75      | 83                | 66      | 15             | 3       |                    |         |                        |         |
| St. Louis, Mo.....  | 687,029   | 250                                       | 25               | 2       | 53       | 20      | 42                | 22      | 4              | 1       |                    |         |                        |         |
| <i>Cities having from 300,000<br/>to 500,000 inhabitants.</i> |   |   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Buffalo, N. Y.....  | 423,715   | 142                                       | 9                | 1       | 62       | 23      | 12                | 14      | 2              | 1       |                    |         |                        |         |
| Cincinnati, Ohio.....   | 364,463   | 135                                       | 8                |         | 16       | 23      | 25                | 21      |                | 1       |                    |         |                        |         |
| Detroit, Mich.....  | 465,766   | 188                                       | 19               | 3       |          | 46      | 1                 | 2       |                |         |                    |         |                        |         |
| Los Angeles, Cal.....   | 319,198   | 116                                       | 13               | 1       |          | 6       | 1                 | 1       |                |         |                    |         |                        |         |
| Milwaukee, Wis.....   | 373,857   | 125                                       | 8                | 3       | 97       | 35      | 4                 | 9       | 15             |         |                    |         |                        |         |
| Newark, N. J.....   | 347,469   | 93  | 20               | 2       | 27       | 12      | 20                | 10      | 7              |         |                    |         |                        |         |
| New Orleans, La.....  | 339,075   | 115                                       | 6                | 1       | 1        | 16      | 31                | 13      |                | 1       |                    |         |                        |         |
| San Francisco, Cal.....                                       | 416,912   | 135                                       | 2                |         | 60       | 4       | 9                 | 43      | 18             | 3       |                    |         |                        |         |
| Washington, D. C.....   | 331,069   | 147                                       | 4                |         | 46       | 2       | 17                | 6       | 2              |         |                    |         |                        |         |
| <i>Cities having from 200,000<br/>to 300,000 inhabitants.</i> |   |   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Denver, Colo.....   | 213,381   | 58  | 7                | 1       |          | 6       |                   | 3       |                | 11      |                    |         |                        |         |
| Jersey City, N. J.....  | 267,779   | 84  |                  | 2       |          |         |                   |         |                | 16      |                    |         |                        |         |
| Kansas City, Mo.....  | 248,381   | 49  | 11               | 2       | 4        | 6       |                   |         |                | 2       |                    |         |                        |         |
| Providence, R. I.....   | 224,326   | 73  | 12               | 2       | 18       | 3       | 12                |         |                | 5       |                    |         |                        |         |



*Morbidity and mortality table, cities of the United States, for week ended Apr. 6, 1912—*  
Continued

| Cities.  | Population<br>United<br>States<br>census<br>1910. | Total<br>deaths<br>from<br>all<br>causes. | Diph-<br>theria. |         | Measles. |         | Scarlet<br>fever. |         | Small-<br>pox. |         | Tuber-<br>culosis. |         | Ty-<br>phoid<br>fever. |         |
|--|---|---|------------------|---------|----------|---------|-------------------|---------|----------------|---------|--------------------|---------|------------------------|---------|
|  |   |   | Cases.           | Deaths. | Cases.   | Deaths. | Cases.            | Deaths. | Cases.         | Deaths. | Cases.             | Deaths. | Cases.                 | Deaths. |
| Cities having from 25,000 to 50,000 inhabitants—Continued. |   |   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Lancaster, Pa.   | 47,227  |   | 1                |         | 117      |         | 2                 |         |                |         | 4                  |         |                        |         |
| Lexington, Ky.   | 35,099  | 19  | 1                |         |          |         | 1                 |         |                |         |                    | 1       |                        |         |
| Lima, Ohio.  | 30,508  | 7   | 3                |         | 1        |         | 1                 |         |                |         |                    |         |                        |         |
| Lynchburg, Va.   | 29,494  | 5   | 1                |         | 44       |         | 1                 |         |                |         |                    |         | 1                      |         |
| Malden, Mass.  | 44,404  | 6   | 1                |         | 12       |         | 2                 |         |                |         |                    |         |                        |         |
| Montgomery, Ala.   | 38,136  | 13  | 1                |         | 4        |         |                   |         | 2              |         | 1                  | 1       |                        |         |
| Mount Vernon, N. Y.  | 30,919  |   | 10               |         | 31       |         | 8                 |         |                |         |                    |         |                        |         |
| Newcastle, Pa.   | 36,280  |   | 3                |         |          |         |                   |         |                |         | 7                  | 3       | 3                      |         |
| Newport, Ky.   | 30,309  | 12  |                  |         |          |         | 7                 |         |                |         | 3                  | 3       |                        |         |
| Newton, Mass.  | 39,806  | 8   |                  |         | 37       |         | 2                 |         |                |         |                    |         |                        |         |
| Niagara Falls, N. Y.                                       | 30,445  | 16  |                  |         |          |         | 2                 |         |                |         | 1                  | 1       |                        | 1       |
| Norristown, Pa.  | 27,875  | 10  | 5                |         | 13       |         |                   |         |                |         | 1                  | 2       |                        |         |
| Orange, N. J.  | 29,630  | 5   | 1                |         | 2        |         |                   |         |                |         | 1                  | 1       | 1                      |         |
| Pittsfield, Mass.  | 32,121  | 7   | 2                |         | 2        |         |                   |         |                |         | 1                  |         | 1                      |         |
| Portsmouth, Va.  | 33,190  | 10  |                  |         |          |         |                   |         | 8              |         |                    |         |                        |         |
| Racine, Wis.   | 38,002  | 11  | 2                | 1       |          |         | 4                 |         |                |         |                    | 1       |                        |         |
| Roanoke, Va.   | 34,874  | 14  | 2                |         | 31       |         |                   |         |                |         | 22                 | 6       |                        |         |
| Rockford, Ill.   | 45,401  | 12  |                  |         |          |         | 5                 |         |                |         |                    | 1       | 19                     | 2       |
| Salem, Mass.   | 43,097  | 12  |                  |         |          |         |                   |         |                |         |                    | 1       |                        |         |
| San Diego, Cal.  | 39,578  | 5   |                  |         | 3        |         | 1                 |         |                |         | 4                  | 4       |                        |         |
| Superior, Wis.   | 40,384  | 3   |                  |         |          |         |                   |         |                |         |                    |         | 1                      | 3       |
| Taunton, Mass.   | 34,259  | 18  |                  |         | 1        |         | 1                 |         |                |         | 3                  | 2       |                        |         |
| Waltham, Mass.   | 27,834  | 4   |                  |         | 33       |         | 1                 |         |                |         |                    |         |                        |         |
| West Hoboken, N. J.  | 35,403  | 8   | 2                |         |          |         | 4                 |         |                |         |                    | 1       |                        |         |
| Wheeling, W. Va.   | 41,641  | 21  |                  |         | 3        |         |                   |         |                |         | 1                  | 3       | 3                      |         |
| Williamsport, Pa.  | 31,860  | 7   |                  |         | 8        |         |                   |         |                |         |                    |         | 1                      | 80      |
| Wilmington, N. C.  | 25,748  | 9   | 1                |         | 6        |         |                   |         | 2              |         |                    |         |                        |         |
| York, Pa.  | 44,750  |   |                  |         |          |         | 1                 |         |                |         | 4                  |         | 1                      |         |
| Zanesville, Ohio.  | 28,026  | 13  | 1                | 1       |          |         | 2                 |         |                |         | 17                 | 1       |                        |         |
| Cities having less than 25,000 inhabitants.                |   |   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Alameda, Cal.  | 23,833  | 6   |                  |         | 3        |         | 1                 |         |                |         |                    |         |                        |         |
| Beaver Falls, Pa.  | 12,191  | 1   | 1                | 1       |          |         |                   |         |                |         |                    |         | 1                      |         |
| Bennington, Vt.  |   | 4   |                  |         | 1        |         |                   |         |                |         | 3                  | 2       |                        |         |
| Cambridge, Mass.   | 11,327  | 2   |                  |         | 1        |         |                   |         |                |         |                    |         |                        |         |
| Carbondale, Pa.  | 17,040  | 8   |                  |         | 13       |         |                   |         |                |         |                    |         |                        |         |
| Clinton, Mass.   | 13,075  | 6   |                  |         |          |         |                   |         |                |         |                    | 1       |                        |         |
| Coffeyville, Kans.   | 12,687  |   | 1                |         |          |         |                   |         |                |         |                    |         |                        |         |
| Columbus, Ga.  | 20,554  | 5   |                  |         |          |         |                   |         | 3              |         |                    |         |                        |         |
| Concord, N. H.   | 21,497  | 10  | 1                |         | 9        |         |                   |         |                |         |                    |         |                        |         |
| Cumberland, Md.  | 21,839  | 9   |                  |         | 10       |         |                   |         |                |         | 1                  | 1       | 2                      |         |
| Dunkirk, N. Y.   |   | 8   |                  |         |          |         |                   |         |                |         |                    | 2       |                        |         |
| Galesburg, Ill.  | 20,089  | 9   |                  |         |          |         |                   |         |                |         |                    | 1       |                        |         |
| Harrison, N. J.  | 14,498  | 2   |                  |         |          |         | 1                 |         |                |         | 1                  |         |                        |         |
| Homestead, Pa.   | 18,713  | 9   |                  |         | 1        |         |                   |         |                |         |                    | 1       |                        |         |
| Kearny, N. J.  | 18,659  | 6   | 2                |         | 6        |         | 1                 |         |                |         |                    |         |                        |         |
| La Fayette, Ind.   | 20,081  | 7   |                  |         |          |         |                   |         |                |         |                    | 2       |                        |         |
| Logansport, Ind.   | 19,050  | 4   |                  |         |          |         |                   |         |                |         |                    | 1       | 10                     | 1       |
| Marinette, Wis.  | 14,610  | 5   |                  |         |          |         | 1                 |         |                |         |                    |         |                        |         |
| Marlboro, Mass.  | 14,577  | 2   | 1                |         |          |         | 1                 |         |                |         |                    |         |                        |         |
| Massillon, Ohio  |   | 2   |                  |         | 2        |         |                   |         |                |         |                    |         |                        |         |
| Medford, Mass.   | 23,156  | 6   | 3                |         | 12       |         |                   |         |                |         |                    |         |                        |         |
| Melrose, Mass.   | 15,715  | 5   |                  |         | 28       |         | 2                 |         |                |         | 2                  | 1       |                        |         |
| Moline, Ill.   | 24,199  | 7   |                  |         | 9        |         |                   |         |                |         |                    | 1       | 1                      |         |
| Montclair, N. J.   | 21,150  | 8   |                  |         |          |         |                   |         |                |         | 4                  | 1       | 1                      |         |
| Morristown, N. J.  | 12,507  | 3   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Nanticoke, Pa.   | 18,507  | 7   | 1                |         |          |         |                   |         |                |         |                    |         |                        |         |
| Newburyport, Mass.   | 19,240  | 5   |                  |         |          |         |                   |         |                |         | 1                  |         |                        |         |
| North Adams, Mass.   | 22,012  | 4   |                  |         | 4        |         |                   |         |                |         | 3                  | 2       |                        |         |
| Northampton, Mass.   | 19,431  | 9   |                  |         |          |         |                   |         |                |         | 1                  |         |                        |         |
| Palmer, Mass.  |   | 1   |                  |         |          |         |                   |         |                |         |                    |         |                        |         |
| Pottstown, Pa.   |   | 9   |                  |         |          |         | 1                 |         |                |         |                    |         | 1                      |         |
| Saratoga Springs, N. Y.                                    |   | 3   | 1                |         |          |         | 1                 |         |                |         |                    | 1       |                        |         |
| South Bethlehem, Pa.                                       | 19,973  | 8   |                  |         | 10       |         |                   |         |                |         | 6                  | 1       |                        |         |
| Steelton, Pa.  | 14,246  | 6   | 3                | 1       |          |         |                   |         |                |         | 1                  |         | 1                      |         |
| Tiffin, Ohio.  | 11,894  |   |                  |         |          |         | 1                 |         |                |         |                    | 1       | 2                      |         |
| Wilkinsburg, Pa.   | 18,924  |   |                  |         |          |         | 1                 |         |                |         | 1                  |         |                        |         |
| Woburn, Mass.  | 15,308  | 3   | 1                |         | 7        |         |                   |         |                |         |                    |         |                        |         |

**STATISTICAL REPORTS OF MORBIDITY AND MORTALITY, STATES  
OF THE UNITED STATES (Untabulated.)**

**CONNECTICUT.**—Month of March, 1912. Population of reporting towns, 1,126,694. Total number of deaths from all causes 1,663, including diphtheria 14, measles 18, scarlet fever 13, tuberculosis (pulmonary) 124, typhoid fever 9. Cases reported: Diphtheria 156 in 41 towns, measles 1,144 in 64 towns, scarlet fever 228 in 52 towns, smallpox 68 in 3 towns, tuberculosis (pulmonary) 131 in 46 towns, typhoid fever 24 in 14 towns.

**FLORIDA.**—Week ended April 6, 1912. Reports received from the State board of health show diphtheria present in 3 localities with 5 cases, malaria in 4 localities with 17 cases, smallpox in 7 counties with 22 cases, tuberculosis in 9 localities with 21 cases, typhoid fever in 2 localities with 6 cases.

**KANSAS.**—Month of February, 1912. Population 1,690,949. Total number of deaths from all causes not reported. The deaths include diphtheria 7, measles 2, scarlet fever 9, typhoid fever 2. Cases reported: Diphtheria 106, measles 434, scarlet fever 248, smallpox 20, typhoid fever 40.

**MASSACHUSETTS.**—Week ended February 3, 1912. Population of reporting towns 2,593,485. Total number of deaths from all causes 865, including diphtheria 12, measles 4, scarlet fever 1, tuberculosis 72, typhoid fever 2. Cases reported: Diphtheria 144, measles 624, scarlet fever 154, smallpox 9, tuberculosis 163, typhoid fever 18.

Week ended February 10, 1912. Total number of deaths from all causes 851, including diphtheria 11, measles 7, scarlet fever 2, tuberculosis 70, typhoid fever 1. Cases reported: Diphtheria 131, measles 574, scarlet fever 149, smallpox 3, tuberculosis 24, typhoid fever 24.

Week ended February 17, 1912. Total number of deaths from all causes 894, including diphtheria 8, measles 12, scarlet fever 8, tuberculosis 96, typhoid fever 4. Cases reported: Diphtheria 116, measles 491, scarlet fever 140, smallpox 2, tuberculosis 183, typhoid fever 16.

Week ended February 24, 1912. Total number of deaths from all causes 895, including diphtheria 7, measles 3, scarlet fever 5, tuberculosis 60, typhoid fever 2. Cases reported: Diphtheria 128, measles 559, scarlet fever 123, tuberculosis 151, typhoid fever 20.



## FOREIGN AND INSULAR.

### CHINA.

#### Chaochowfu—Plague.

Consul Williams at Swatow reports March 16 the presence of plague at Chaochowfu, the principal city in the Swatow consular district.

#### Hongkong—Plague—Smallpox—Plague-infected Rats.

Surg. Brown reports: During the week ended March 9, 1912, 12 cases of plague with 12 deaths and 55 cases of smallpox with 43 deaths were reported in Hongkong.

During the same period 1,903 rats were examined for plague infection. Two plague-infected rats were found.

### HAWAII.

#### Record of Plague Infection.

The last case of human plague at Honolulu occurred July 12, 1910.

The last plague-infected rat was found at Aiea, 9 miles from Honolulu, April 12, 1910.

A case of human plague was reported at Kapulena, Hawaii, October 28, 1911.

At Hilo the last case of human plague occurred March 23, 1910. At Honokaa, 60 miles from Hilo, a fatal case occurred April 20, 1911; a fatal case February 9, 1912; and 2 fatal cases February 25, 1912.

The last plague-infected rats reported found at Honokaa were 49, found during the week ended March 2, 1912. At Hilo a plague-infected rat was found during the week ended June 10, 1911, and 2 plague-infected rats were reported found February 29, 1912.

#### Honolulu—Plague-prevention Work.

Chief Quarantine Officer Trotter reports:

*Week ended Mar. 30, 1912.*

|  |       |
|--|-------|
| Total rats and mongoose taken.....     | 450   |
| Rats trapped.....                      | 441   |
| Mongoose trapped.....                  | 9     |
| Rats examined bacteriologically.....   | 398   |
| Classification of rats trapped:        |       |
| <i>Mus alexandrianus</i> .....         | 42    |
| <i>Mus musculus</i> .....              | 85    |
| <i>Mus norvegicus</i> .....            | 21    |
| <i>Mus rattus</i> .....                | 293   |
| Average number of traps set daily..... | 1,720 |

## Mosquito-Eradication Measures at Honolulu.

The following statement of the work of mosquito destruction at Honolulu was received from Passed Asst. Surg. McCoy, who is detailed as sanitary adviser to the governor of the Territory of Hawaii:

*Mosquito-eradication measures conducted at Honolulu from Mar. 25 to 30, 1912, both inclusive.*

| Inspections of—                | Total inspections. | Larvæ found in. | Ordered cleaned. | Oiled. | Drained. | Emptied. | Filled. | Ordered repaired. | Screened. | Stocked with mosquito fish. |
|--------------------------------|--------------------|-----------------|------------------|--------|----------|----------|---------|-------------------|-----------|-----------------------------|
| Gutters, house.....            | 680                | 7               | 49               |        |          |          |         | 8                 |           |                             |
| Gutters, street.....           | 311                | 32              |                  | 77     |          |          |         |                   |           |                             |
| Standing water.....            | 394                | 32              |                  | 70     | 14       |          |         |                   |           |                             |
| Cesspools.....                 | 975                | 43              |                  | 71     |          |          |         | 26                |           |                             |
| Privy vaults.....              | 1,432              | 24              |                  | 35     |          |          |         | 16                |           |                             |
| Holes and low places.....      | 662                | 169             |                  | 195    | 4        |          | 79      |                   |           | 5                           |
| Catch basins.....              | 425                | 39              |                  | 145    |          |          |         |                   |           |                             |
| Leaky fixtures.....            | 49                 | 1               |                  |        |          |          |         | 35                |           |                             |
| Water-holding plants.....      | 149                | 5               | 5                |        |          |          |         |                   |           |                             |
| Swamps.....                    | 137                | 11              | 7                | 2      |          |          |         |                   |           | 2                           |
| Ponds.....                     | 64                 | 1               |                  | 1      |          |          |         |                   |           |                             |
| Troughs and tanks.....         | 335                | 18              |                  | 1      |          | 30       |         |                   |           | 3                           |
| Tubs or other receptacles..... | 1,086              | 142             | 1                | 11     |          | 451      |         |                   |           |                             |
| Tin cans, bottles.....         | 1,536              | 118             |                  |        |          | 766      |         |                   |           |                             |
| Water barrels.....             | 859                | 41              | 25               |        |          | 61       |         |                   | 115       | 30                          |
| Vacant houses.....             | 223                |                 |                  |        |          |          |         |                   |           |                             |

Number of loads of tin cans collected..... 32  
 Number of rice plantations inspected..... 15

## Summary of Reports, November, 1911-March, 1912.

| Inspections of—                | Total inspections. | Wigglers found in. |
|--------------------------------|--------------------|--------------------|
| Gutters, house.....            | 30,591             | 1,074              |
| Gutters, street.....           | 4,146              | 399                |
| Standing water.....            | 13,181             | 2,031              |
| Cesspools.....                 | 14,306             | 681                |
| Privy vaults.....              | 18,472             | 456                |
| Holes and low places.....      | 11,824             | 1,898              |
| Catch basins.....              | 7,997              | 373                |
| Leaky fixtures.....            | 3,432              | 44                 |
| Water-holding plants.....      | 30,928             | 1,641              |
| Swamps.....                    | 1,336              | 249                |
| Ponds.....                     | 708                | 104                |
| Troughs and tanks.....         | 4,055              | 394                |
| Tubs or other receptacles..... | 10,939             | 1,208              |
| Tin cans, bottles.....         | 259,824            | 2,967              |
| Water barrels.....             | 7,305              | 1,268              |
| Vacant houses.....             | 1,089              | 84                 |
| Yards.....                     | 2,700              | 50                 |
| Grease traps.....              | 863                | 2                  |
| Washhouses.....                | 129                | 5                  |
| Holes in trees.....            | 10,771             | 166                |
| Rice plantations.....          | 54                 | 54                 |

Loads of tin cans collected..... 224  
 Legal notices to abate nuisances served..... 616  
 Nuisances abated..... 525  
 Swamp land drained..... acres.. 30  
 Ditches dug..... miles (estimated).. 20

**INDIA.****Calcutta—Cholera and Plague.**

Acting Asst. Surg. Allan reports: During the week ended March 9 1912, 92 deaths from cholera and 90 from plague were reported at Calcutta; in all Bengal, 3,876 cases of plague; in all India, 19,145 cases of plague, with 16,608 deaths.

**ITALY.****Examination of Emigrants.**

Passed Asst. Surg. Robinson reports:

Vessels inspected at Naples, Messina, and Palermo, week ended March 30:

**NAPLES.**

| Date.   | Name of ship.    | Destination.      | Steerage passengers inspected and passed. | Pieces of baggage inspected and passed. | Pieces of baggage disinfected |
|---------|------------------|-------------------|---|---|-------------------------------|
| Mar. 24 | Saxonia.....     | New York.....     |   |   |                               |
| 26      | San Giorgio..... | do.....           |   |   |                               |
| 27      | Oceania.....     | Philadelphia..... | 1,287                                     | 120                                     | 1,650                         |
| 29      | San Giorgio..... | New York.....     | 767                                       | 60                                      | 980                           |
| 30      | Venezia.....     | do.....           | 845                                       | 110                                     | 1,550                         |
| 30      | Cedric.....      | do.....           | 1,554                                     | 190                                     | 1,870                         |
|         | Total.....       |                   | 4,453                                     | 480                                     | 6,050                         |

**MESSINA.**

|         |                  |               |     |    |     |
|---------|------------------|---------------|-----|----|-----|
| Mar. 27 | San Giorgio..... | New York..... | 122 | 58 | 123 |
| 28      | Borneo.....      | do.....       |     |    |     |
| 28      | Cincinnati.....  | do.....       |     |    |     |
|         | Total.....       |               | 122 | 58 | 123 |

**PALERMO.**

|         |                  |                  |     |     |     |
|---------|------------------|------------------|-----|-----|-----|
| Mar. 27 | Columbia.....    | New York.....    |     |     |     |
| 28      | Oceania.....     | do.....          | 323 | 500 | 400 |
| 28      | San Giorgio..... | do.....          | 324 | 400 | 300 |
| 29      | Cincinnati.....  | do.....          |     |     |     |
| 30      | Monceniso.....   | New Orleans..... |     |     |     |
|         | Total.....       |                  | 907 | 900 | 700 |

**JAPAN.****Plague in Formosa.**

Consul Reat reports the occurrence of 13 cases of plague with 7 deaths in the island of Formosa during the week ended March 16.

From January to May, 1911, 246 cases of plague with 205 deaths were reported in Formosa.

**JAVA.****Batavia—Typhus Fever.**

Consul Rairden reports the occurrence of three cases of typhus fever with 2 deaths during the two weeks ended March 2, 1912.

## SOUTH AFRICA.

## Durban—Plague—Rat Infection.

The following information was received from the department of the interior at Pretoria: During the week ended March 15, 6 cases of plague with 4 deaths were reported at Durban, and during the week ended March 22, 3 cases with 4 deaths. The total number of cases reported to March 22 was 23 with 18 deaths. New foci of rat infection have been discovered.

## VENEZUELA.

## Caracas—Plague.

Information received from the American minister shows plague present at Caracas April 22.

## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX.

## REPORTS RECEIVED DURING THE WEEK ENDED APR. 26, 1912.

[These tables include cases and deaths recorded in reports received by the Surgeon General, Public Health and Marine-Hospital Service, from American consuls through the Department of State and from other sources.]

## CHOLERA.

| Places.       | Date.               | Cases. | Deaths. | Remarks.                                 |
|---------------|---------------------|--------|---------|--|
| India.....    |                     |        |         | Year 1911: Deaths, 323,237. <sup>1</sup> |
| Calcutta..... | Feb. 25-Mar. 2..... |        | 85      |  |
| Madras.....   | Mar. 10-16.....     | 1      | 1       |  |
| Rangoon.....  | Jan. 1-31.....      | 18     | 18      |  |

## YELLOW FEVER.

|            |                |  |   |  |
|------------|----------------|--|---|--|
| Brazil:    |                |  |   |  |
| Ceara..... | Feb. 1-29..... |  | 4 |  |

## PLAGUE.

|                      |                     |    |    |                                    |
|----------------------|---------------------|----|----|------------------------------------|
| Brazil:              |                     |    |    |                                    |
| Para.....            | Mar. 24-30.....     | 1  |    |                                    |
| Chile:               |                     |    |    |                                    |
| Iquique.....         | Mar. 10-16.....     | 2  | 1  |                                    |
| China:               |                     |    |    |                                    |
| Chaochowfu.....      | do.....             |    |    | Present.                           |
| Hongkong.....        | Mar. 3-9.....       | 12 | 12 |                                    |
| India:               |                     |    |    |                                    |
| Bombay.....          | Mar. 10-16.....     | 76 | 65 |                                    |
| Calcutta.....        | Feb. 22-Mar. 2..... |    | 69 |                                    |
| Rangoon.....         | Jan. 1-31.....      | 30 | 24 |                                    |
| Japan:               |                     |    |    |                                    |
| Formosa.....         | Mar. 7-16.....      | 13 | 7  |                                    |
| Persia:              |                     |    |    |                                    |
| Bushire.....         | Feb. 25-Mar. 2..... | 12 | 9  |                                    |
| South Africa:        |                     |    |    |                                    |
| Durban.....          | Mar. 15-22.....     | 3  | 4  |                                    |
| Straits Settlements: |                     |    |    |                                    |
| Singapore.....       | Feb. 18-24.....     | 1  | 1  |                                    |
| Turkey in Asia:      |                     |    |    |                                    |
| Basra.....           | Feb. 13.....        | 1  | 1  | A stoker on a vessel from Bushire. |
| Jiddah.....          | Feb. 5-Mar. 13..... | 3  | 4  |                                    |
| Venezuela:           |                     |    |    |                                    |
| Caracas.....         | Apr. 22.....        |    |    | Present.                           |

<sup>1</sup> Bulletin Quarantenaire d'Egypte, Mar. 14, 1912.

## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received during Week ended Apr. 26, 1912.

## SMALLPOX.

| Places.                 | Date.               | Cases. | Deaths. | Remarks.  |
|-------------------------|---------------------|--------|---------|---|
| Austria-Hungary:        |                     |        |         |   |
| Galicia.....            | Mar. 17-26.....     | 6      |         |   |
| Brazil:                 |                     |        |         |   |
| Para.....               | Mar. 24-30.....     | 1      | 1       | From Alagoas.                                       |
| Canada:                 |                     |        |         |   |
| Montreal.....           | Apr. 6-13.....      | 2      |         |   |
| Quebec.....             | Apr. 7-13.....      | 8      |         |   |
| Chile:                  |                     |        |         |   |
| Iquique.....            | Mar. 10-16.....     | 1      | 1       |   |
| China:                  |                     |        |         |   |
| Dalny.....              | Mar. 1-23.....      | 3      | 2       |   |
| Hongkong.....           | Mar. 3-9.....       | 55     | 43      |   |
| Egypt:                  |                     |        |         |   |
| Cairo.....              | Mar. 4-11.....      | 1      |         |   |
| Germany:                |                     |        |         |   |
| Great Britain:          | Mar. 4-Apr. 6.....  | 26     |         |   |
| London.....             | Mar. 24-30.....     | 2      |         |   |
| India:                  |                     |        |         |   |
| Bombay.....             | Mar. 10-16.....     | 80     | 46      |   |
| Calcutta.....           | Feb. 22-Mar. 2..... |        | 2       |   |
| Karachi.....            | Mar. 10-16.....     | 78     | 69      |   |
| Rangoon.....            | Jan. 1-31.....      | 42     | 10      |   |
| Italy:                  |                     |        |         |   |
| Leghorn.....            | Mar. 24-30.....     | 1      |         |   |
| Madrass.....            | Mar. 10-16.....     | 12     | 2       |   |
| Naples.....             | Mar. 24-30.....     | 3      |         |   |
| Japan:                  |                     |        |         |   |
| Formosa.....            | Mar. 3-16.....      | 3      |         |   |
| Nogahama.....           | Mar. 17-23.....     | 1      |         | On s. s. Tenyo Maru from Hongkong.                  |
| Philippine Islands..... |                     |        |         | Third quarter, 1911: Manila, 9 cases and no deaths. |
| Portugal:               |                     |        |         |   |
| Lisbon.....             | Mar. 14-20.....     | 3      |         |   |
| Russia:                 |                     |        |         |   |
| Moscow.....             | Mar. 9-16.....      | 1      | 2       |   |
| Odessa.....             | Mar. 19-23.....     | 7      |         |   |
| St. Petersburg.....     | Mar. 17-23.....     | 11     | 7       |   |
| Warsaw.....             | Feb. 11-17.....     | 19     | 4       |   |
| Spain:                  |                     |        |         |   |
| Valencia.....           | Mar. 24-30.....     | 44     | 2       |   |
| Straits Settlements:    |                     |        |         |   |
| Singapore.....          | Feb. 18-Mar. 2..... | 6      | 1       |   |
| Teneriffe:              |                     |        |         |   |
| Santa Cruz.....         | Mar. 24-30.....     |        | 4       |   |
| Turkey in Asia:         |                     |        |         |   |
| Beirut.....             | Mar. 17-23.....     | 90     | 5       |   |

## REPORTS RECEIVED FROM DEC. 30, 1911, TO APR. 19, 1912.

[For reports received from July 1, 1911, to Dec. 29, 1911, see PUBLIC HEALTH REPORTS for Dec. 29, 1911. In accordance with custom, the tables of epidemic diseases are terminated semiannually and new tables begun.]

## CHOLERA.

| Places.                   | Date.                | Cases. | Deaths. | Remarks.  |
|---------------------------|----------------------|--------|---------|---|
| Arabia:                   |                      |        |         |   |
| Hodeida.....              | Jan. 21.....         | 2      | 1       |   |
| Ras-el-Ketib.....         | Dec. 27-Jan. 1.....  |        |         | Total cases, 22; deaths, 12; mainly in the military hospital. |
| Austria-Hungary:          |                      |        |         |   |
| Coastland—                |                      |        |         |   |
| Capodistria.....          | Dec. 14-24.....      | 2      | 2       |   |
| Croatia and Slavonia..... |                      |        |         | Total Oct. 22-Dec. 16: Cases, 36.                             |
| Sriem.....                | Oct. 22-Dec. 16..... | 36     |         |   |
| Hungary.....              |                      |        |         | Total Nov. 19-Dec. 23: Cases, 37. Free Dec. 28.               |
| Backs-Bodog.....          | Dec. 10-16.....      | 9      | 5       |   |
| Jasz-Nagykun-Szolnok..... | Dec. 3-23.....       | 11     | 7       |   |
| Torontal.....             | Nov. 19-Dec. 16..... | 17     | 2       |   |
| Bahrein Island.....       | Nov. 27-Dec. 30..... |        | 260     | In the Persian Gulf.  |
| Bulgaria:                 |                      |        |         |   |
| Burgas.....               | Nov. 22-23.....      | 2      | 2       |   |
| Varna.....                | Nov. 6.....          | 1      |         |   |
| China:                    |                      |        |         |   |
| Hongkong.....             | Jan. 14-20.....      | 1      | 1       |   |

## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

## CHOLERA—Continued.

| Places.                 | Date.               | Cases. | Deaths. | Remarks.  |
|-------------------------|---------------------|--------|---------|---|
| Dutch East Indies.....  |                     |        |         | Total year 1911: Cases, 3,624; deaths, 2,919, including report, p. 2062, vol. 1. Free Dec. 31.  |
| Batavia.....            | Nov. 12-Dec. 23...  | 21     | 8       |   |
| India:                  |                     |        |         |   |
| Bassein.....            | Jan. 14-Feb. 24.... | 109    | 90      |   |
| Calcutta.....           | Nov. 5-Feb. 24....  |        | 688     |   |
| Madras.....             | Nov. 26-Mar. 7....  | 540    | 438     | Madras Presidency, Nov. 1-Dec. 31: Cases, 10,436; deaths, 6,545. Jan. 1-Feb. 29: Cases, 18,267; deaths, 11,563.   |
| Moulmine.....           | Feb. 18-24.....     | 2      | 2       |   |
| Negapatam.....          | Jan. 14-Feb. 24.... |        | 79      |   |
| Pondicherry.....        | Feb. 22-28.....     | 4      | 4       |   |
| Rangoon.....            | Oct. 1-Dec. 31....  | 62     | 52      |   |
| Indo-China:             |                     |        |         |   |
| Saigon.....             | Nov. 20-Mar. 4....  | 1,520  | 1,066   |   |
| Italy.....              |                     |        |         | Total June 8-Dec. 31: Cases, 15,985; deaths, 6,022.   |
| Provinces—              |                     |        |         |   |
| Caltanissetta.....      | Nov. 26-Dec. 31...  | 9      | 7       |   |
| Girgenti.....           | do.....             | 105    | 57      |   |
| Messina.....            | Nov. 26-Dec. 2....  | 3      | 2       |   |
| Syracuse.....           | Nov. 26-Dec. 23...  | 15     | 9       |   |
| Malta.....              | Nov. 19-Dec. 10...  | 6      | 6       | Dec. 23 declared free from cholera.   |
| Montenegro.....         | Nov. 4-11.....      | 9      | 5       |   |
| Persia:                 |                     |        |         |   |
| Adaban.....             | Nov. 4.....         | 1      | 1       |   |
| Kermanshah.....         | Dec. 18-20.....     |        | 37      |   |
| Philippine Islands..... |                     |        |         | Third quarter, 1911: Manila, 1 fatal case; Provinces, 27 cases and 22 deaths.   |
| Province—               |                     |        |         |   |
| Union.....              | Oct. 29-Dec. 4....  | 5      | 5       |   |
| Roumania.....           |                     |        |         | Total Sept. 9-Dec. 13: Cases, 192; deaths, 42, including report, p. 2094, vol. 1. Free Dec. 19.   |
| Districts—              |                     |        |         |   |
| Braila.....             | Sept. 11-Dec. 13... | 84     | 11      | Including cases previously reported.  |
| Convuluri.....          | Oct. 31-Nov. 28.... | 21     | 1       |   |
| Dolju.....              | Nov. 6-Dec. 13....  | 19     | 4       |   |
| Jalonitza.....          | Oct. 31-Nov. 28.... | 4      |         |   |
| Konstanza.....          | Oct. 30-Nov. 28.... | 8      |         |   |
| Prahova.....            | Nov. 6-23.....      | 1      | 1       |   |
| Talomita.....           | do.....             | 2      |         |   |
| Tulcea.....             | Nov. 24-Dec. 13...  | 15     | 1       |   |
| Servia.....             |                     |        |         | Total year 1911: Cases, 95; deaths, 51, including report, p. 2095, vol. 1. Declared free Dec. 31.   |
| Belgrade district.....  | Nov. 26-Dec. 16...  | 6      | 4       |   |
| Siam:                   |                     |        |         |   |
| Bangkok.....            | Nov. 5-Jan. 27....  |        | 755     |   |
| Straits Settlements:    |                     |        |         |   |
| Singapore.....          | Nov. 5-Feb. 3....   | 4      | 4       |   |
| Tripoli:                |                     |        |         |   |
| Tripoli.....            | Oct. 13-Jan. 24.... |        |         | Cases, 2,000; deaths, from 1,000 to 1,200.  |
| Tunis Regency.....      |                     |        |         | Total Nov. 25-Jan. 4: Cases, 462; deaths, 323. No cases since Jan. 10.  |
| Beja district.....      | Nov. 25-Dec. 21...  | 71     | 20      |   |
| Bizerta district.....   | Nov. 25-Dec. 5....  | 9      | 15      |   |
| Turkey in Asia.....     |                     |        |         | Provinces in Asia and Europe, Apr. 16-Dec. 30, 1911: Deaths, 6,111, excluding Constantinople. Mainly among troops. Jan. 6-Feb. 27: Cases, 101; deaths, 126. |
| Acre.....               | Jan. 21.....        |        | 33      | In vicinity.  |
| Adana.....              | Dec. 2-Mar. 20....  | 21     | 5       |   |
| Aleppo.....             | Jan. 26-Mar. 9....  | 36     | 23      |   |
| Amara.....              | Oct. 15.....        | 1      | 1       |   |
| Basra.....              | Oct. 22-28.....     | 14     | 10      |   |
| Erzeroum, vilayet.....  | Sept. 11-16.....    | 50     | 28      |   |
| Erzeroum.....           | do.....             | 11     | 8       |   |
| Kaifa.....              | Dec. 8.....         |        |         | Present.  |
| Kerbalah.....           | Oct. 20-28.....     | 10     | 10      |   |
| Kharput.....            | Nov. 19-Dec. 30...  | 47     | 47      |   |



## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

## CHOLERA—Continued.

| Places.                          | Date.               | Cases. | Deaths. | Remarks.   |
|----------------------------------|---------------------|--------|---------|--|
| <b>Turkey in Asia—Continued.</b> |                     |        |         |  |
| Jiddah.....                      | Dec. 2-24.....      | 323    | 310     | Sept. 1-Dec. 24: Cases, 1,648;<br>deaths, 1,565. |
| Mekka.....                       | Dec. 4-24.....      | 905    | 879     |  |
| Mersina.....                     | Dec. 1-7.....       | 2      | 1       |  |
| Osmania.....                     | Dec. 1-6.....       | 2      | 4       | Present.   |
| Sinope.....                      | Dec. 7.....         | 2      | 1       |  |
| Tor.....                         | Dec. 14-26.....     | 29     | 34      |  |
| Trebizond and vicinity.....      | Sept. 18-23.....    | 64     | 34      | Present.   |
| Tripoli.....                     | Jan. 4.....         |        |         |  |
| <b>Turkey in Europe:</b>         |                     |        |         |  |
| Constantinople.....              | Oct. 24-Feb. 3..... | 8      | 2       | In Serres.                                       |
| Durazzo.....                     | Dec. 7-13.....      | 2      |         |  |
| Janina.....                      | Jan. 14-22.....     | 17     | 8       |  |
| Loros.....                       | Jan. 22.....        | 12     | 7       | In Serres.                                       |
| Saloniki, vilayet.....           | Nov. 6-19.....      | 4      | 3       |  |

## YELLOW FEVER.

|                                    |                      |     |    |  |
|------------------------------------|----------------------|-----|----|--|
| <b>Brazil:</b>                     |                      |     |    |  |
| Bahia.....                         | Mar. 23.....         |     |    | Present.   |
| Ceara.....                         | Jan. 1-Feb. 29.....  |     | 5  |  |
| Manaos.....                        | Nov. 19-Mar. 23..... |     | 49 |  |
| Para.....                          | Dec. 9-16.....       | 1   | 1  |  |
| Pernambuco.....                    | Jan. 1-Feb. 15.....  |     | 10 |  |
| <b>Canal Zone:</b>                 |                      |     |    |  |
| Culebra Island quarantine.....     | Jan. 1-31.....       | 1   |    | From a vessel from Guayaquil.                              |
| <b>Chile:</b>                      |                      |     |    |  |
| Tocopilla.....                     | Apr. 11.....         | 38  | 12 |  |
| <b>Ecuador:</b>                    |                      |     |    |  |
| Bucay.....                         | Nov. 16-Feb. 29..... | 7   | 2  |  |
| Duran.....                         | Dec. 1-Feb. 29.....  | 13  | 6  |  |
| Guayaquil.....                     | Nov. 16-Feb. 29..... | 118 | 54 |  |
| Huigra.....                        | Feb. 1-29.....       |     |    | 1 case.  |
| Milagro.....                       | do.....              | 16  | 7  |  |
| Naranjito.....                     | do.....              | 2   | 2  |  |
| Yaguachi.....                      | do.....              |     |    | 1 case.  |
| <b>Mexico:</b>                     |                      |     |    |  |
| Espita.....                        | Dec. 31-Jan. 6.....  | 1   |    |  |
| Kambul, hacienda.....              | Feb. 21-27.....      |     | 7  |  |
| Maxcanu.....                       | Dec. 31-Jan. 6.....  | 1   |    |  |
| Merida.....                        | Nov. 12-Mar. 23..... | 20  | 9  | Total Aug. 1-Mar. 23: Cases, 65; deaths, 29.               |
| Puerto Mexico (Coatzacoalcos)..... | Feb. 28.....         |     | 1  |  |
| Salina Cruz.....                   | Feb. 4-7.....        |     |    | 7 cases in the lazaretto from s. s. Ikalis from Guayaquil. |
| Temax.....                         | Dec. 31-Jan. 6.....  | 1   |    |  |
| <b>Portuguese Guinea:</b>          |                      |     |    |  |
| Bolama.....                        | Dec. 19-25.....      | 1   | 1  | In an engineer on a vessel.                                |
| <b>Venezuela:</b>                  |                      |     |    |  |
| Caracas.....                       | Nov. 16-Feb. 15..... | 30  | 13 |  |
| Macuto.....                        | Mar. 16-19.....      | 1   | 1  |  |
| Maiquetia.....                     | Feb. 24-Mar. 9.....  | 3   | 1  | A suburb of La Guaira.                                     |
| Sabana Grande.....                 | Dec. 12.....         |     |    | Epidemic.  |
| <b>West Indies:</b>                |                      |     |    |  |
| St. Vincent.....                   | Feb. 19.....         | 1   |    |  |
| At sea.....                        | Dec. 17-23.....      | 1   | 1  | On a vessel en route from Manaos to Para.                  |

## PLAGUE.

|                             |                     |    |    |  |
|-----------------------------|---------------------|----|----|--|
| <b>Algeria:</b>             |                     |    |    |  |
| Philippeville.....          | Oct. 19-Nov. 11.... | 8  | 2  | Including 5 cases, p. 2096, Vol. XXVI. |
| <b>Azores:</b>              |                     |    |    |  |
| Fayal.....                  | Jan. 10.....        |    |    | Still present.                         |
| Terceira.....               | do.....             |    |    | Do.                                    |
| <b>Brazil:</b>              |                     |    |    |  |
| Bahia.....                  | Sept. 1-30.....     |    | 2  | 1 case pneumonic.                      |
| Para.....                   | Dec. 24-Feb. 17.... | 18 | 12 |  |
| Pernambuco.....             | Oct. 1-Feb. 15....  |    | 8  |  |
| Rio de Janeiro.....         | Nov. 12-Feb. 10.... | 7  | 3  |  |
| <b>British East Africa:</b> |                     |    |    |  |
| Kismayu.....                | Oct. 15-25.....     | 2  |    |  |

## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

## PLAGUE—Continued.

| Places.                                  | Date.                | Cases. | Deaths. | Remarks.  |
|--|----------------------|--------|---------|---|
| Chile:                                   |                      |        |         |   |
| Iquique.....                             | Nov. 12-Mar. 27....  | 12     | 6       |   |
| Pisagua.....                             | Nov. 1-30.....       | 8      |         |   |
| China:                                   |                      |        |         |   |
| Amoy.....                                | Jan. 13.....         |        | 1       |   |
| Hongkong.....                            | Dec. 9-Mar. 2.....   | 38     | 32      |   |
| Dutch East Indies:                       |                      |        |         |   |
| Java.....                                |                      |        |         | Total Mar. 1-Dec. 30: Cases, 1,817; deaths, 1,324.  |
| Paseroean Residency,<br>Malang District. | Nov. 12-Mar. 2....   | 104    | 61      |   |
| Soerabaya.....                           | Oct. 17-27.....      | 2      |         |   |
| Ecuador:                                 |                      |        |         |   |
| Duran.....                               | Feb. 1-29.....       | 1      |         |   |
| Guayaquil.....                           | Nov. 16-Feb. 29....  | 124    | 52      | Dec. 16-Jan. 31: Reports not available because of revolution.                                 |
| Egypt.....                               |                      |        |         | Total Jan. 1-Dec. 31, 1911: Cases, 1,656; deaths, 1,041, including cases previously reported. |
| Provinces—                               |                      |        |         |   |
| Assiout.....                             | Jan. 1-Mar. 15.....  | 45     | 30      | Sept. 11-16: Cases, 50; deaths, 28.   |
| Assouan.....                             | Jan. 1-Mar. 17.....  | 27     | 16      |   |
| Behera.....                              | Jan. 1-25.....       | 3      | 2       | Sept. 11-16: Cases, 11; deaths, 8.  |
| Beni Souef.....                          | Feb. 16-Mar. 14....  | 17     | 7       |   |
| Fayoum.....                              | Jan. 1-26.....       | 1      |         |   |
| Galioubeh.....                           | Jan. 1-Mar. 10.....  | 4      | 3       | Oct. 5-Dec. 26: Cases, 1.   |
| Garbieh.....                             | Jan. 1-Mar. 4.....   | 15     | 6       |   |
| Girgeh.....                              | Feb. 28.....         | 1      | 1       |   |
| Kena.....                                | Jan. 1-Mar. 7.....   | 26     | 17      | Nov. 20-Dec. 13: Cases, 3; deaths, 3.   |
| Menouf.....                              | Feb. 2-Mar. 7.....   | 3      | 1       |   |
| Mimieh.....                              | Jan. 1-Mar. 15.....  | 13     | 3       | Dec. 13: Cases, 1.  |
| German East Africa:                      |                      |        |         |   |
| Dar-es-Salaam.....                       | Nov. 13-15.....      | 1      | 1       | From the interior via Bergamogo.  |
| Hawaii:                                  |                      |        |         |   |
| Honakaa.....                             | Feb. 9-Mar. 18....   | 4      | 4       |   |
| India:                                   |                      |        |         |   |
| Bombay.....                              | Nov. 19-Mar. 9.....  | 256    | 228     |   |
| Calcutta.....                            | Nov. 11-Feb. 17..... |        | 224     |   |
| Karachi.....                             | Nov. 26-Mar. 9.....  | 322    | 268     | Total year 1911: Cases, 3,273; deaths, 3,046.   |
| Madras.....                              | Jan. 1-6.....        | 1      | 1       |   |
| Rangoon.....                             | Oct. 1-Dec. 31.....  | 50     | 50      |   |
| Bombay Presidency and<br>Sind.....       | Oct. 29-Feb. 24....  | 53,979 | 39,376  |   |
| Madras Presidency.....                   | do.....              | 9,171  | 7,166   |   |
| Bengal.....                              | do.....              | 22,567 | 18,954  |   |
| United Provinces.....                    | do.....              | 54,172 | 48,434  |   |
| Punjab.....                              | do.....              | 4,890  | 3,758   |   |
| Burma.....                               | do.....              | 1,042  | 939     |   |
| Eastern Bengal and Assam.....            | Jan. 1-Feb. 24.....  | 2      | 2       |   |
| Central Provinces.....                   | Oct. 29-Feb. 24....  | 18,383 | 14,620  |   |
| Coorg.....                               | do.....              | 88     | 52      |   |
| Mysore State.....                        | do.....              | 8,162  | 6,309   |   |
| Hyderabad State.....                     | do.....              | 23,295 | 21,218  |   |
| Central India.....                       | do.....              | 7,496  | 6,187   |   |
| Rajputana and Ajmere.....                | do.....              | 950    | 772     |   |
| Merwara.....                             |                      |        |         |   |
| Kashmir.....                             | Feb. 3-23.....       | 38     | 19      |   |
| North West Province.....                 | Oct. 29-Feb. 24....  | 2      | 2       | Total for India, Oct. 29-Feb. 24: Cases, 204,237; deaths, 167,808.                            |
| Indo-China:                              |                      |        |         | Total year 1911: Cases, 828,535; deaths, 691,849.   |
| Saigon.....                              | Nov. 13-Mar. 4.....  | 33     | 5       |   |
| Mauritius.....                           | Nov. 3-Mar. 8.....   | 64     | 34      |   |
| Persia:                                  |                      |        |         |   |
| Buchir.....                              | Feb. 4-24.....       | 19     | 5       |   |
| Peru:                                    |                      |        |         |   |
| Departments—                             |                      |        |         |   |
| Callao.....                              | Oct. 1-21.....       | 1      |         | City, in November, 1 case; in January, 3 cases with 2 deaths; Mar. 1-26, 12 cases.            |
| Chiclayo.....                            | do.....              | 12     | 4       |   |
| Chosica.....                             | do.....              | 1      | 1       |   |
| Lambayeque.....                          | do.....              | 3      |         |   |
| Libertad.....                            | do.....              | 8      |         | Mar. 13, 30 cases in the lazaretto at Trujillo.   |
| Lima.....                                | do.....              | 13     | 6       |   |
| Cebu quarantine station.....             | Dec. 4.....          | 1      |         | On s. s. Montrose from Shanghai   |

## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

## PLAGUE—Continued.

| Places.                   | Date.               | Cases. | Deaths. | Remarks.  |
|---------------------------|---------------------|--------|---------|---|
| Russian Empire:           |                     |        |         |   |
| Astrakhan, government.... | Sept. 21-Jan. 7.... | 201    | 180     | Including 73 cases and 63 deaths reported on page 2098, Vol. I. |
| Siam:                     |                     |        |         |   |
| Bangkok.....              | Nov. 4-Jan. 27....  |        | 3       |   |
| South Africa:             |                     |        |         |   |
| Durban.....               | Jan. 14-Mar. 22.... |        |         | Total: Cases 23, deaths 18.                                     |
| Straits Settlements:      |                     |        |         |   |
| Singapore.....            | Nov. 5-Feb. 10....  | 26     | 23      |   |
| Turkey in Asia:           |                     |        |         |   |
| Jiddah.....               | Jan. 13-Feb. 2....  | 6      | 1       |   |
| Venezuela:                |                     |        |         |   |
| Caracas.....              | Mar. 12.....        | 1      |         |   |
| West Indies:              |                     |        |         |   |
| Trinidad.....             | Apr. 2-13.....      | 4      |         |   |
| At sea.....               | Mar. 1-11.....      | 1      | 1       | On s. s. Macedonia from Bombay to Aden.                         |

## SMALLPOX.

|                      |                     |     |     |   |
|----------------------|---------------------|-----|-----|---|
| Algeria:             |                     |     |     |   |
| Algiers.....         | Nov. 1-30.....      |     | 1   |   |
| Oran.....            | Jan. 1-31.....      | 2   | 1   |   |
| Arabia:              |                     |     |     |   |
| Aden.....            | Nov. 28-Mar. 24.... | 17  | 8   | And vicinity.   |
| Argentina:           |                     |     |     |   |
| Buenos Aires.....    | Jan. 1-31.....      |     | 2   | Oct. 1-31, 6 deaths. No deaths in Nov. or Dec., 1911. |
| Rosario.....         | Oct. 1-Jan. 31..... |     | 40  |   |
| Australia:           |                     |     |     |   |
| Thursday Island..... | Jan. 2.....         | 1   |     | From s. s. Taiyuan.                                   |
| Austria-Hungary:     |                     |     |     |   |
| Bohemia.....         | Jan. 14-20.....     | 2   |     |   |
| Budapest.....        | Jan. 4-10.....      | 25  |     |   |
| Galicia.....         | Dec. 24-Mar. 16.... | 5   | 1   |   |
| Krain.....           | Jan. 14-20.....     | 7   |     |   |
| Trieste.....         | Dec. 3-9.....       | 1   |     | From s. s. Baron Cail from Beirut.                    |
| Tyrol.....           | Jan. 14-Mar. 9....  | 3   |     |   |
| Brazil:              |                     |     |     |   |
| Bahia.....           | July 1-31.....      |     | 1   |   |
| Pernambuco.....      | Oct. 1-Feb. 15..... |     | 635 |   |
| Rio de Janeiro.....  | Nov. 26-Feb. 24.... | 18  | 1   |   |
| Santos.....          | Dec. 12-23.....     |     | 1   |   |
| Canada:              |                     |     |     |   |
| British Columbia—    |                     |     |     |   |
| Fernie.....          | Feb. 26-Mar. 16.... | 5   |     |   |
| Nelson.....          | Dec. 24-30.....     | 1   |     |   |
| Victoria.....        | Feb. 4-10.....      | 1   |     |   |
| Manitoba—            |                     |     |     |   |
| Winnipeg.....        | Jan. 14-Apr. 6....  | 2   |     |   |
| Nova Scotia—         |                     |     |     |   |
| Halifax.....         | Mar. 24-Apr. 6....  | 2   |     |   |
| Ontario—             |                     |     |     |   |
| Kingston.....        | Dec. 19-23.....     | 1   |     |   |
| Ottawa.....          | Dec. 10-Mar. 23.... | 91  |     |   |
| Sarnia.....          | Oct. 17-Mar. 23.... | 43  |     |   |
| Toronto.....         | Jan. 6-Mar. 24....  | 3   | 1   |   |
| Windsor.....         | Feb. 4-Mar. 16....  | 8   |     |   |
| Quebec               |                     |     |     |   |
| Montreal.....        | Dec. 17-Mar. 16.... | 22  |     |   |
| Quebec.....          | Dec. 10-Mar. 30.... | 262 | 2   |   |
| Ceylon:              |                     |     |     |   |
| Colombo.....         | Nov. 12-Feb. 10.... | 3   |     | And vicinity.   |
| Chile:               |                     |     |     |   |
| Iquique.....         | Dec. 10-Jan. 20.... | 3   | 1   |   |
| La Serena.....       | Nov. 21-30.....     | 14  |     |   |
| Santiago.....        | Nov. 1-30.....      | 685 | 343 |   |
| Talcahuano.....      | Nov. 26-Dec. 23.... | 11  | 3   |   |
| Valparaiso.....      | Dec. 3-Mar. 9....   | 68  |     | Feb. 17—Decreasing.                                   |
| China:               |                     |     |     |   |
| Canton.....          | Nov. 11-Dec. 30.... | 40  | 6   |   |
| Chenghai.....        | Jan. 29-Mar. 16.... |     |     | Present.  |
| Chungking.....       | Nov. 18-Mar. 2....  |     |     | Do.   |
| Dalny.....           | Mar. 3-9.....       | 6   |     |   |

## CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

## SMALLPOX—Continued.

| Places.                    | Date.               | Cases. | Deaths. | Remarks.   |
|----------------------------|---------------------|--------|---------|--|
| <b>China—Continued.</b>    |                     |        |         |  |
| Hankow.....                | Jan. 21-Feb. 17.... | 2      | 1       |  |
| Hongkong.....              | Nov. 12-Mar. 2....  | 503    | 371     |  |
| Kityang.....               | Jan. 21-Mar. 16.... |        |         | Present.   |
| Nanking.....               | Dec. 10-Mar. 16.... |        |         | Do.  |
| Shanghai.....              | Dec. 11-Feb. 18.... | 1      | 6       | Deaths among natives.  |
| Swatow.....                | Mar. 2.....         |        |         | Present.   |
| <b>Cuba:</b>               |                     |        |         |  |
| Habana.....                | Dec. 19-Jan. 19.... | 2      |         | Case Dec. 19 from German s. s. Frankenwald, from Spain and Canary Islands; case Jan. 19 from s. s. Mexico. |
| <b>Egypt:</b>              |                     |        |         |  |
| Cairo.....                 | Dec. 10-Mar. 4....  | 4      | 1       |  |
| Port Said.....             | Jan. 30-Feb. 4....  | 1      |         |  |
| <b>France:</b>             |                     |        |         |  |
| Havre.....                 | Mar. 10-16.....     |        | 4       |  |
| Marseille.....             | Jan. 1-Feb. 29....  |        | 4       | Nov. 1-30, 1 death.  |
| Paris.....                 | Dec. 3-Mar. 16....  | 113    | 2       |  |
| <b>Germany:</b>            |                     |        |         |  |
| Hamburg.....               | Jan. 21-27.....     | 1      |         | Total, Dec. 31-Mar. 23: Cases 63.  |
| Gibraltar.....             | Feb. 27-Mar. 3....  | 1      |         |  |
| <b>Great Britain:</b>      |                     |        |         |  |
| Bristol.....               | Jan. 29-Feb. 3....  | 2      |         |  |
| Liverpool.....             | Mar. 17-23.....     | 1      |         |  |
| London.....                | Jan. 14-Feb. 24.... | 6      | 1       |  |
| Southampton.....           | Mar. 3-9.....       | 1      |         |  |
| West Hartlepool.....       | Feb. 18-Mar. 9....  | 2      |         |  |
| <b>India:</b>              |                     |        |         |  |
| Bombay.....                | Nov. 19-Mar. 9....  | 466    | 223     |  |
| Calcutta.....              | Nov. 19-Feb. 17.... |        | 23      |  |
| Madras.....                | Nov. 26-Mar. 9....  | 142    | 58      |  |
| Rangoon.....               | Oct. 1-Dec. 31....  | 61     | 17      |  |
| <b>Indo-China:</b>         |                     |        |         |  |
| Saigon.....                | Nov. 13-Mar. 4....  | 37     | 7       |  |
| <b>Italy:</b>              |                     |        |         |  |
| Genoa.....                 | Dec. 1-Mar. 15....  | 45     | 2       |  |
| Leghorn.....               | Dec. 16-Mar. 16.... | 95     | 1       |  |
| Messina.....               | Nov. 19-Jan. 31.... |        | 6       |  |
| Naples.....                | Dec. 3-Mar. 25....  | 91     | 1       |  |
| Palermo.....               | Nov. 26-Mar. 23.... | 2,599  | 885     |  |
| Turin.....                 | Jan. 15-Mar. 24.... | 8      |         |  |
| <b>Japan:</b>              |                     |        |         |  |
| Arima-Mura.....            | Nov. 12-18.....     | 6      | 1       | 11 miles east from Kobe.   |
| Kanagawa, ken.....         | Dec. 17-23.....     | 1      |         |  |
| Kobe.....                  | Jan. 22-28.....     | 2      | 1       | Jan. 20, 1 case from s. s. Suverie from Hongkong; Jan. 28, 1 case from Shingo Maru.                        |
| Nagasaki.....              | Feb. 12-18.....     | 1      |         |  |
| Yokohama.....              | Jan. 22.....        | 1      |         | From s. s. Hydra from New York via Suez.   |
| <b>Java:</b>               |                     |        |         |  |
| Batavia.....               | Nov. 12-Mar. 2....  | 43     | 12      |  |
| <b>Malta:</b>              |                     |        |         |  |
| Malta.....                 | Dec. 24-Jan. 6....  | 2      | 1       |  |
| <b>Mexico:</b>             |                     |        |         |  |
| Aguascalientes.....        | Dec. 18-Mar. 3....  |        | 7       |  |
| Chihuahua.....             | Nov. 20-Feb. 11.... | 92     | 36      |  |
| Coahuila, State.....       | Oct. 1-30.....      |        | 16      |  |
| Guadalajara.....           | Jan. 14-Apr. 6....  | 6      | 2       |  |
| Juarez.....                | Dec. 19-Mar. 9....  | 14     | 5       |  |
| Magdalena.....             | Dec. 23-Mar. 12.... | 91     | 50      | Mar. 12, 10 cases present.   |
| Manzanillo.....            | Feb. 18-24.....     | 1      |         |  |
| Mazatlan.....              | Dec. 11-Mar. 19.... |        | 11      | Mar. 16, 25 cases in the lazaretto.  |
| Mexico.....                | Nov. 26-Feb. 17.... | 135    | 67      |  |
| Monterey.....              | Dec. 11-24.....     |        | 2       |  |
| Porfirio Diaz.....         | Dec. 3-Mar. 23....  |        | 35      |  |
| Salina Cruz.....           | Feb. 11-Mar. 9....  | 4      | 2       | Mar. 23, present in vicinity.  |
| San Antonio.....           | Jan. 1-21.....      | 12     | 9       |  |
| San Carlos.....            | do.....             |        |         | Present.   |
| Sandoval.....              | Dec. 16.....        |        |         | Do.  |
| San Ignacio.....           | Jan. 8.....         | 3      |         |  |
| Saric.....                 | Jan. 21-27.....     |        | 6       |  |
| Santa Ana.....             | Jan. 8.....         | 4      |         |  |
| San Luis Potosi.....       | Nov. 12-Feb. 10.... | 4      | 1       |  |
| Tampico.....               | Dec. 1-Mar. 30....  |        | 15      |  |
| Tapachula.....             | Nov. 1-Jan. 31....  |        | 18      |  |
| <b>Philippine Islands.</b> |                     |        |         |  |
|                            |                     |        |         | Third quarter, 1911: Manila, 9 cases; no deaths.   |

**Reports Received from Dec. 30, 1911, to Apr. 19, 1912.**

## SMALLPOX—Continued.

| Places.              | Date.                | Cases. | Deaths. | Remarks.                   |
|----------------------|----------------------|--------|---------|----------------------------|
| Portugal:            |                      |        |         |                            |
| Lisbon.....          | Dec. 9-Mar. 19. .... | 49     |         |                            |
| Russia:              |                      |        |         |                            |
| Batum.....           | Dec. 1-31.....       | 1      |         |                            |
| Libau.....           | Dec. 17-23.....      | 1      |         |                            |
| Moscow.....          | Nov. 19-Mar. 9.....  | 47     | 3       |                            |
| Odessa.....          | Nov. 26-Mar. 16..... | 24     | 1       |                            |
| Reval.....           | Nov. 1-30.....       | 1      |         |                            |
| Riga.....            | Dec. 24-Jan. 27..... | 16     |         |                            |
| St. Petersburg.....  | Nov. 19-Mar. 16..... | 159    | 29      | Oct. 1-Nov. 30; deaths, 2. |
| Warsaw.....          | Nov. 5-Feb. 10.....  |        | 283     |                            |
| Siam:                |                      |        |         |                            |
| Bangkok.....         | Nov. 5-Jan. 27.....  |        | 1,326   |                            |
| Siberia:             |                      |        |         |                            |
| Omsk.....            | Jan. 1-31.....       | 7      |         |                            |
| South Africa:        |                      |        |         |                            |
| Durban.....          | Jan. 21-Feb. 24..... | 4      |         |                            |
| Johannesburg.....    | Jan. 7-Feb. 10.....  | 36     |         |                            |
| Spain:               |                      |        |         |                            |
| Barcelona.....       | Feb. 6-12.....       |        | 1       |                            |
| Cadiz.....           | Nov. 1-Feb. 29.....  |        | 27      |                            |
| Madrid.....          | Dec. 1-Jan. 31.....  |        | 3       |                            |
| Malaga.....          | Nov. 1-30.....       |        | 45      |                            |
| Seville.....         | Dec. 1-Feb. 29.....  |        | 8       |                            |
| Valencia.....        | Dec. 3-Mar. 23.....  | 293    | 13      |                            |
| Straits Settlements: |                      |        |         |                            |
| Penang.....          | Feb. 11-17.....      | 1      |         |                            |
| Singapore.....       | Nov. 19-Feb. 17..... | 26     | 10      |                            |
| Switzerland:         |                      |        |         |                            |
| Cantons—             |                      |        |         |                            |
| Oberwalden.....      | Jan. 14-20.....      | 1      |         |                            |
| Zurich.....          | Dec. 3-23.....       | 6      |         |                            |
| Teneriffe:           |                      |        |         |                            |
| Santa Cruz.....      | Dec. 3-Mar. 16.....  |        | 48      |                            |
| Turkey in Asia:      |                      |        |         |                            |
| Beirut.....          | do.....              | 1,335  | 102     |                            |
| Turkey in Europe:    |                      |        |         |                            |
| Constantinople.....  | Dec. 4-Mar. 24.....  |        | 128     |                            |
| Uruguay:             |                      |        |         |                            |
| Montevideo.....      | Sept. 1-Dec. 31..... | 25     | 4       |                            |
| Venezuela:           |                      |        |         |                            |
| Caracas.....         | Nov. 1-Jan. 15.....  | 11     | 2       |                            |
| Zanzibar:            |                      |        |         |                            |
| Zanzibar.....        | Oct. 28-Dec. 15..... | 3      | 2       |                            |

**WEEKLY MORTALITY TABLE, FOREIGN AND INSULAR CITIES.**

| Cities               | Week ended— | Estimated population. | Total deaths from all causes. | Deaths from—  |         |          |               |           |               |                |                |             |          |                 |
|----------------------|-------------|-----------------------|-------------------------------|---------------|---------|----------|---------------|-----------|---------------|----------------|----------------|-------------|----------|-----------------|
|                      |             |                       |                               | Tuberculosis. | Plague. | Cholera. | Yellow fever. | Smallpox. | Typhus fever. | Typhoid fever. | Scarlet fever. | Diphtheria. | Measles. | Whooping cough. |
| Aberdeen.....        | Mar. 16     | 163,084               | 55                            | .....         | .....   | .....    | .....         | .....     | .....         | .....          | 1              | .....       | 1        | .....           |
| Aguaascalientes..... | Apr. 7      | 40,000                | 56                            | .....         | .....   | .....    | .....         | .....     | .....         | .....          | .....          | .....       | .....    | .....           |
| Aix la Chapelle..... | Mar. 16     | 157,578               | 74                            | 9             | .....   | .....    | .....         | .....     | 3             | 1              | .....          | .....       | 4        | .....           |
| Amsterdam.....       | Mar. 30     | 582,586               | 129                           | 26            | .....   | .....    | .....         | .....     | 1             | .....          | .....          | 2           | .....    | .....           |
| Antwerp.....         | Mar. 23     | 316,604               | 72                            | 6             | .....   | .....    | .....         | .....     | .....         | .....          | 1              | .....       | 1        | .....           |
| Athens.....          | do.....     | 250,010               | 73                            | 31            | .....   | .....    | .....         | .....     | .....         | .....          | 3              | .....       | .....    | .....           |
| Barmen.....          | do.....     | 171,200               | .....                         | 5             | .....   | .....    | .....         | .....     | .....         | .....          | .....          | .....       | 1        | .....           |
| Batavia.....         | Mar. 2      | 217,630               | .....                         | .....         | .....   | .....    | .....         | .....     | 1             | .....          | .....          | .....       | .....    | .....           |
| Belfast.....         | Mar. 30     | 385,492               | 145                           | 24            | .....   | .....    | .....         | .....     | .....         | .....          | .....          | .....       | .....    | 10              |
| Belgrade.....        | Mar. 23     | 90,050                | 29                            | .....         | .....   | .....    | .....         | .....     | .....         | .....          | .....          | .....       | .....    | .....           |
| Berlin.....          | Mar. 16     | 2,085,258             | 646                           | 103           | .....   | .....    | .....         | .....     | .....         | 1              | 4              | 28          | 14       | .....           |
| Bordeaux.....        | Mar. 30     | 253,000               | 100                           | 10            | .....   | .....    | .....         | .....     | .....         | .....          | .....          | .....       | 5        | .....           |
| Bremen.....          | Mar. 16     | 246,850               | 87                            | 16            | .....   | .....    | .....         | .....     | .....         | .....          | 4              | 1           | 7        | .....           |
| Brunswick.....       | do.....     | 145,000               | .....                         | 3             | .....   | .....    | .....         | .....     | .....         | 2              | 3              | 7           | .....    | .....           |
| Brussels.....        | Mar. 23     | 739,684               | 175                           | 26            | .....   | .....    | .....         | .....     | .....         | .....          | 1              | .....       | 3        | .....           |





MORTALITY FOREIGN AND INSULAR COUNTRIES AND CITIES  
(Untabulated.)

**BRITISH EAST AFRICA—Mombasa.**—Month of February, 1912. Population, 26,000. Total number of deaths from all causes 37, including tuberculosis 2.

**GREAT BRITAIN.**—Week ended March 23, 1912:

*England and Wales.*—The deaths registered in 77 great towns correspond to an annual rate of 14.1 per 1,000 of the population, which is estimated at 17,559,219.

*Ireland.*—The deaths registered in 21 principal town districts correspond to an annual rate of 20.7 per 1,000 of the population, which is estimated at 1,157,014. The lowest rate was recorded at Waterford, viz, 7.6, and the highest at Dundalk, viz, 43.7, per 1,000.

*Scotland.*—The deaths registered in 18 principal towns correspond to an annual rate of 17.4 per 1,000 of the population, which is estimated at 2,182,400. The lowest rate was recorded at Partick, viz, 5.3, and the highest at Kilmarnock, viz, 25.5, per 1,000. The total number of deaths from all causes was 726, including diphtheria 9, measles 50, scarlet fever 5, typhoid fever 2.

**ITALY—Genoa.**—Two weeks ended March 31, 1912. Population, 272,077. Total number of deaths from all causes 199, including diphtheria 4, tuberculosis 20.

**NEW ZEALAND.**—Month of December, 1911.

*Auckland.*—Population, 102,676. Total number of deaths 81, including tuberculosis 2.

*Christchurch.*—Population, 80,193. Total number of deaths 40, including tuberculosis 4.

*Dunedin.*—Population, 61,828. Total number of deaths 42, including tuberculosis 3.

*Wellington.*—Population, 70,729. Total number of deaths 58, including tuberculosis 5, typhoid fever 1.

**PANAMA—Panama.**—Month of March, 1912. Population, 30,000. Total number of deaths from all causes not reported. The deaths include diphtheria 1, tuberculosis 11.

**SPAIN—Almeria.**—Month of March, 1912. Population, 50,910. Total number of deaths from all causes 127, including tuberculosis 11, typhoid fever 2.

**TRIPOLI—Tripoli.**—Two months ended March 31, 1912. Population, 50,000. Total number of deaths from all causes 509, including measles 3, tuberculosis 13, typhoid fever 28.

TURKS ISLANDS.—Two weeks ended April 6, 1912. Population, 1,675. One death. No contagious diseases.

VENEZUELA—*La Guaira*.—Two weeks ended March 15, 1912. Population, 10,000. Total number of deaths from all causes 13, including tuberculosis 2, typhoid fever 1.

By authority of the Secretary of the Treasury:

RUPERT BLUE,  
*Surgeon General,*  
*United States Public Health and Marine-Hospital Service.*

---

ADDITIONAL COPIES of this publication  
may be procured from the SUPERINTEND-  
ENT OF DOCUMENTS, Government Printing  
Office, Washington, D. C., at 5 cents per copy.  
Subscription price, per volume..... \$2

---

